

February 3, 1938

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THE IRON AGE

FEBRUARY 3, 1938

ESTABLISHED 1855

Vol. 141, No. 5

Let's Do Some Real Devil Baiting

DEVIL baiting is an old occupation. Witch doctors of all ages have used it to gain prestige and power from a superstitious public.

Untold generations of Africans have paid tribute to grotesquely painted witch doctors whose "mumbo jumbo" was supposed to drive out the devils of disease. Undoubtedly the contortions of these mountebanks were effective, however, to the extent that they took the victim's mind off his troubles.

Nearer home, or indeed at home, the Indian medicine man profitably employed the same tactics. For a fee, he would undertake to drive out the devil of drought and to make rain come to appease the thirst of a parched country. If it happened to rain, the medicine man was that much ahead; and he planned it that way; if it did not—well, it was a good show anyway.

The modern politician is no slouch at devil baiting. He has found it effective in the past to proclaim himself the friend and champion of the "pee-pul" and an enemy of the "interests." He has not found it advisable, however, to name or to define strictly the devil that he was setting out to bait. It is much better to leave something to the imagination. An unknown devil is much more terrifying than one that you can recognize as Tom Jones or Bill Smith. Besides, if you pin your devil down, he might have a convincing comeback and be able to prove that he had neither horns nor tail.

We can't blame the politicians for using a technique that has been so time honored and so effective. But we can blame people, in this supposedly enlightened day and age, for falling for it. People ought to insist on politicians' calling their shots and not permit them to bang away at all the balls on the table.

Now is the time to disregard the imaginary devils and fight a real one—the devil of depression who hurts everybody. Labor, most of all, should want to fight him for he sticks his fork further into the workers than into any other group.

But first labor should determine who summoned this devil of depression. He has been told that it is the employer. Why not find out? Why not summon the employer and have him state his case. Have him give you his reasons why business is bad.

Employers, I believe, would be glad of this opportunity. Few of them would do it without an invitation from labor because they might be accused, by politicians, of propaganda. But there is no law to prevent labor, union or non-union, from calling upon the employer to tell why his business is bad or what he thinks could be done to make it better.

J. H. Van Doren

Using Arithmetic in Collective

THE facts of economics and business management are deeply shrouded in fog to a great many employees. That is why they listen to the voices of demagogues telling them they ought to have a larger share of their employer's revenue. It is not that they are avaricious or consciously revolutionary. They do not know the answers to the agitator's claims. They are in the dark as to the employer's side of it. And it must be admitted that employers seldom have done much to enlighten them.

Let us take a hypothetical case of a candid, liberal employer and show how he presents some of these basic facts to his workers in conference. We will call him Mr. Brown, head of the Brown Co., a small manufacturing concern. His 100 factory employees have a shop committee with which the company has dealt on a number of minor matters but so far the question of wages has not reached the bargaining stage. However, he has been informed that outside union pressure has brought that stage almost to a head, and now he has assembled the plant workers in a general conference to "talk turkey." In the conference the employee viewpoint will be voiced by two members of the shop committee, *First Spokesman* and *Second Spokesman*.

Simple Division

Mr. Brown: "I am given to understand that you men feel we should make a general advance in wages. Frankly, I'd like to see all of you making more, just as I'd like to do better myself. I hope that between us we can work out a way to do it. But first I want to take you into my confidence and give you some facts about the business which we have just assembled. I'm going to lay all the



cards in our hand down before you, faces up.

"I have here a careful estimate by the sales department on the amount of our product which we can reasonably expect to sell during the next year. And in this other report are figures by Mr. Robinson (production manager) on what it will take to produce that amount of goods. Using present equipment at present efficiency he finds that it will require 208,000 man-hours of labor. A man-hour is our measure of work—one hour's labor for one man. In the light of our past experience and all that we can predict of the market situation this means that we will have \$145,600 to spend for wages in the plant.

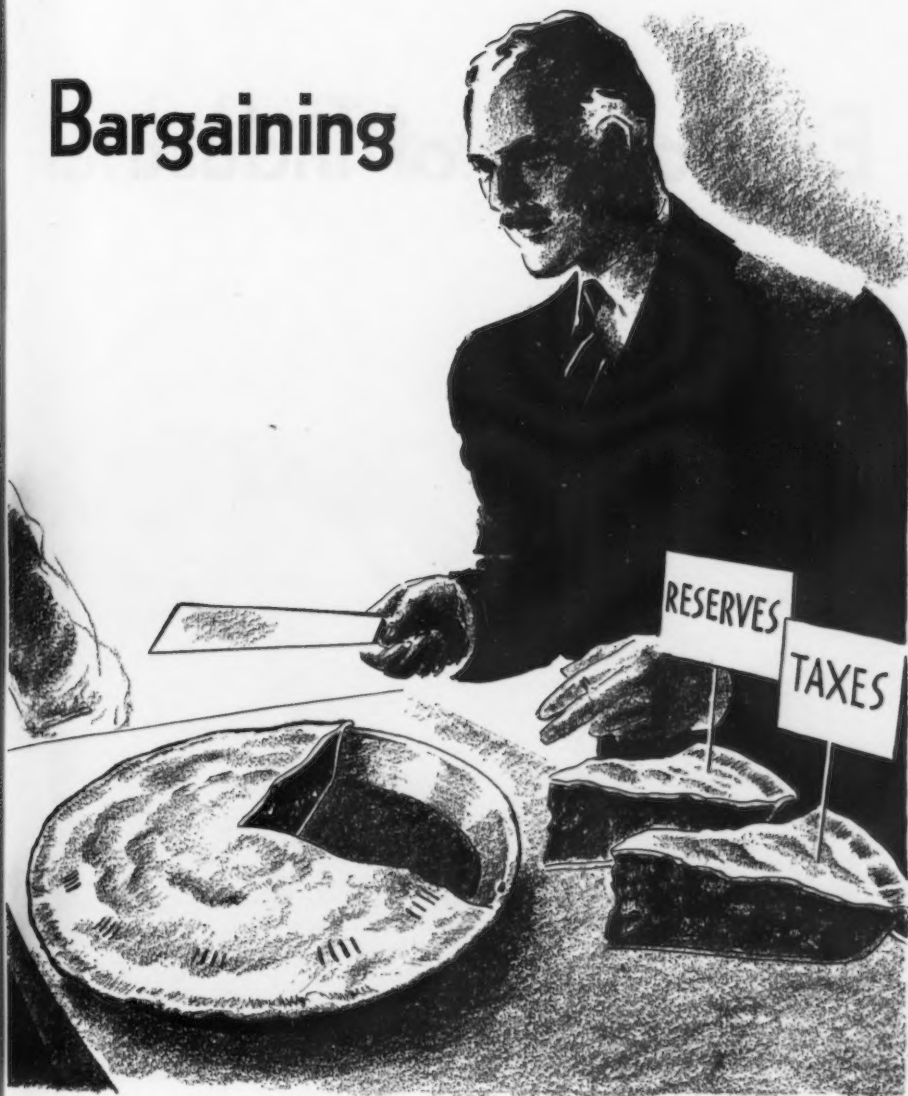
"By dividing this amount among the 100 men now in our employ we can continue to provide you with 40 hr. work a week for 52 weeks

at an average hourly wage rate of 70c. Of course there are other ways of dividing it. If it can be done without disrupting our manufacturing schedules we might increase the work week to 44 hr., raise the weekly wage from \$28 to \$30.80, and provide each of you with 48½ weeks' work during the year. That way the annual wage would remain the same—\$1456.

"Another way would be to give 90 of you 44 hr. work a week for 52 weeks, which would increase your annual earnings to \$1617. But what would become of the other 10? The same job could be done by 110 men working 36 hours a week for 52 weeks, or 40 hr. a week for 47 weeks. That would give jobs to 10 unemployed men, but it would reduce your average annual earnings by \$2.80 a week, or \$145.60 a year."

Bargaining

By FRED DeARMOND



First Spokesman: Can't you get the working hours down without reducing annual earnings, Mr. Brown?"

Mr. Brown: "Yes, in one way. Your working hours can be shortened without reducing annual wages if you men individually can produce more goods per hour and per day. In other words, if through our combined efforts we can reduce the number of man-hours required to produce our quota for the year, that spells fewer working hours for each of you."

First Spokesman: "But in each of those divisions that you named doesn't the hourly wage remain the same—70c? Isn't there some way to get it up?"

Mr. Brown: "Yes, it remains the same in each instance. We can divide it in such a way as to give

you a larger or a smaller annual wage, a longer or a shorter work week, but the only way we can change the basic hourly rate is for you to produce more. As the number of man-hours necessary to produce our quota of goods is reduced, that figure divided into the money available for wages would give an hourly rate proportionally higher than 70c. So you see that better production per man would enable you to work fewer hours and earn the same wages, or the same hours and earn more. In either case it raises your hourly rate."

Second Spokesman: "Isn't there still another way, Mr. Brown, by which you could get our hourly rate and our annual earnings both up, without our turning out more work per hour? Couldn't you do

that by raising your prices on the product we make?"

Mr. Brown: "You are quite right. If we could charge more and sell the same volume then we could pay you more, because it would increase the amount available for wages. But that is a big 'if.' In general, the higher we put our prices the less goods we sell, so that we cannot ordinarily expect to raise our revenue by raising our prices."

Mr. Robinson: "If I may interrupt, Mr. Brown, I would like to point out that if every concern followed the plan of raising its prices in order to raise wages nobody would be any better off by it. You would get a little more in your pay envelope but you would pay it all out in higher prices of everything you buy."

Mr. Brown: "You see, this thing is like cutting a pie. Whether you make four or five or six slices it's still the same pie; more slices do not make more pie. Likewise annual wages often are not increased by higher wage rates. They may only serve to make less work, therefore add nothing to total earnings. The only sure way to increase earnings is to produce more on the job. Check that up and you'll find it holds good everywhere. The unions can get you a higher rate but they can't get you more money—when it isn't there to be had."

Second Spokesman: "Excuse me, Mr. Brown, but as I see it you still haven't proved it isn't there to be had. How about the company's profits?"

Mr. Brown: "That was the first place we turned when we considered the laudable desire of you men to make more for your efforts. Last year we did approximately \$300,000 of business and after all expenses were paid we had something like \$10,500 profit or 3½ per cent. To date this year it is running about 3 per cent."

(CONTINUED ON PAGE 116)

The Economics of Industrial

CHAPTER 24 of a Series on the Economics of Materials Handling Methods and Equip- ment.

• • •

IN a recent paper on materials handling progress prepared by Mr. George E. Stringfellow, vice-president of Thomas A. Edison, Inc., appears these significant words: "According to reliable estimates, the application of the battery industrial truck to the materials handling problems of industry results in a saving of more than \$150,000,000 a year." If there be added to this figure the similar savings resulting from the use of gasoline and gasoline-electric powered industrial trucks, the whole amount must approach nearly a quarter of a billion dollars. This is a bit amazing at first glance, and certainly warrants an attempt to answer the question, "How are such savings effected?"

It seems to be an axiom of industrial enterprise that the attention of management is never so intently centered on cost-reducing programs as during a period of rising business activity—such as was witnessed in the first nine months of 1937. At such a time rising labor and materials costs adversely affect the costs of production in general. With this comes, of course, a sharpening of competition, which always tends to depress prices. Caught between the nether and upper millstones of rising costs and lowering prices, the manufacturer struggles to prevent his profits from disintegrating. With little or no control over the prices he can get for his goods, he looks within his own organization for ways and means to reduce his costs of operation—and discovers the advantages of equipment modernization.

With inventive genius constantly at work devising better, quicker, and less expensive methods of making goods,



YALE battery-powered 4-motor crane truck of 3000-lb. capacity at 8-ft. outreach. Separate motors for hoist, boom, slew and truck drives.

his search does not proceed very far until he finds a machine here that will double production in the same time at equal labor cost, another machine there that will give equal production at a large decrease in both labor and material costs, a method of procedure that will produce equal or better results in less time with lower material cost, or a scheme of operation that utilizes heretofore wasted energy along efficient and time-saving lines. He invests in this new equipment and installs the new methods of operation, feeling that he is well on the road to producing dividends out of decreased production costs; and then realizes that, to secure the full benefits from his new equipment and methods, there is a little matter of coordination to be accomplished.

Almost invariably the modernization of materials handling methods lags behind the modernization of pro-

duction processes. Few production men realize at the outset that the installation of new types of highspeed, automatic production equipment instantly renders obsolete the old materials handling methods; that the new production equipment is absolutely dependent for its efficient operation on increased rapidity in bringing materials to it to be worked upon, and taking them away again when they have been processed.

From the mass production plant primarily, this elementary but essential idea is obtained: The use efficiency of any production machine is a product of its load factor multiplied by its utilization factor. If the full load capacity is 10 hp. and the average load is but 8 hp. the load factor of use is 80 per cent. If the working day is 10 hr. long, but the machine is actually used but 8 hr. per day, the utilization factor is likewise 80 per

Truck Operation

By FRANCIS JURASCHEK
Consulting Editor, *The Iron Age*



MERCURY center control and rear control tilting, telescoping fork trucks handling heavy pallet loads of sacked grain, thus doubling warehouse storage space.

cent. The efficiency of use of the machine is then 0.80×0.80 or 64 per cent, since this represents the value of the actual use of the machine as compared with its theoretical complete use. Now, it is quite evident that both factors entering into this figure are subject to the efficiency with which the materials handling system serving the machine in question supplies it with material to be worked upon, and takes that material away to the next process in sequence. Consequently the first law of the economics of materials handling systems is evidently this:

The First Law

1—That system of materials handling is most efficient (other things being equal) which gets the largest *payload where* it is needed, *when* it is needed, dependably.

Three factors are evident in this statement: payload, destination, and

time. These factors may be elaborated upon as follows: The payload should be as large as possible compared with the weight of the mechanical equipment required to move it, since the expenditure of energy required to move a double-size load, plus the equipment, is not twice the amount required to move a single-size load, plus the equipment. Hence, the larger the payload, within limits, the less the unit cost of moving. In moving a payload from A to B the costs of handling are in almost direct proportion to the distance covered; hence the shorter the distance which must be covered, the more economical the handling. And, the time consumed in handling affects the economics of the situation from two points of view: (1) getting the goods where they are needed when they are needed and, (2) getting the utmost possible use out of the materials handling equipment. From these

points it follows that the quicker the equipment operates, the more loads it can carry in a given period, and the more effectively it can serve production machines; hence the more economical is its operation.

The gist of the first law of economics can be expressed therefore in these words: The greatest economy in the use of any materials handling system may be had when that system is designed to handle *large* payloads over *short* distances, *quickly*. This law is true of all mechanical handling systems. With respect to industrial trucks its truth is evident in the fact that equipment has steadily grown larger and more powerful, so that payloads might be increased and handling time decreased. At the same time, the range of application has multiplied, both as regards the character of work done and the availability of the truck for continuous service up to 24 hr. a day, over any area of travel. A consideration of these facts introduces a second law, peculiarly inclusive of the special characteristics of the industrial truck:

2—That system of materials handling is most efficient (other things being equal) which is most completely self-contained as to handling functions; that is, which eliminates the greatest amount of rehandling.

The Second Law

A quick glance at the history of the development of the industrial truck reveals the truth of the second law of economics. The prototype was a tractor, designed to pull a string of trailers. Each trailer had to be loaded and unloaded separately. Then came the straight load-carrying truck, combining the functions of load-carrying and transfer in the one piece of equipment. Following this came the low-lift drop-platform truck which picked up skid-loads of material; then the high-lift truck to pile skid-loads in tiers to heights of less than 10 feet.

From this point on development has been rapid, with the introduction of the tilting fork mechanism to pick up pallet-loads, the ram mechanism to pick up coils, the curved pan and finger grips to pick up and up-end rolls, and the telescoping lift, to extend tiering operations many tiers high. In all these developments the essential point to bear in mind was the fact that, little by little the truck was turned from a mere load-carrying mechanism into a complete handling mechanism, self-loading and self-discharging, within extraordinarily wide limits. And, the more nearly it approaches the complete self-contained unit, the more is re-handling eliminated.

Since it is re-handling, rather than transfer itself, which adds the greatest expense in any process of moving materials or goods, the more completely a materials handling system eliminates the labor of loading, unloading, and in-between re-handling, the more economical will the operation be.

Finally, just as in a production machine, so in a materials handling system, use-efficiency depends on the product of the multiplication of the load factor and the utilization factor. Here, both these factors are as much a function of the *planning* of the system as of the *equipment* used. This thought brings us to an expression of the third law of the economics of materials handling:

3—That system of materials handling is most efficient (other things



YALE battery-powered tilting fork truck handling self-nesting blocks of zinc spelter which require no skids or pallets.

being equal) which continually utilizes the full capacity of the equipment involved.

The Third Law

Manifestly, no equipment, no matter how efficient its inherent qualities may be, can be truly economical unless these qualities are used to the fullest possible extent. To accomplish a certain task now taking 30 min., a new piece of equipment may be installed which cuts the time down to 6 min. In itself that makes a saving of time

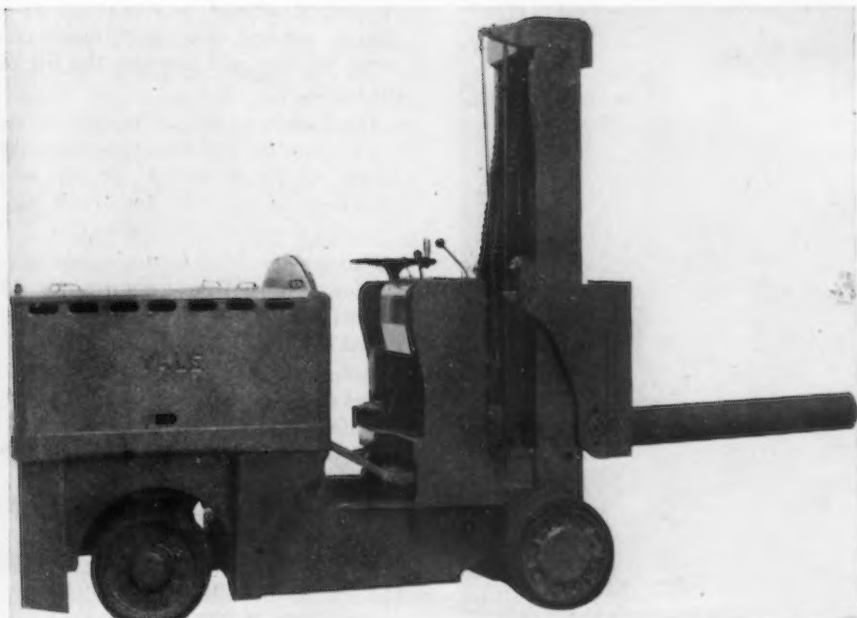
which permits a five-fold multiplication of output. But, unless the 24 min. per job which is saved by the new equipment can be effectively utilized by other equipment in the plant, or by additional equipment, the apparent saving in costs may not be a real saving at all. And herein lies the essence of the argument mentioned in the fourth paragraph of this discussion. Coordination is the key to the effective use of any modern industrial equipment. Unless that new equipment is, by careful planning, fitted in exactly to the whole production scheme, its economy will be questionable.

There is a somewhat be-whiskered story of an Irish power plant engineer who was told that the installation of a certain type of stoker would enable him to use a much cheaper grade of coal, and save half his annual costs. With a twinkle in his eye he replied, "Begorra, I'll put in *two* of those stokers, then, and save it all!" That is no sillier than to thoroughly modernize one operation in a chain of processes, and expect the net result to be a lowering of production costs. An industrial materials handling system is not an entity; it is always part and parcel of a larger scheme of operations of which every phase must be strictly coordinated with every other phase to secure any beneficial results.

Here, then, we can see the answer to the question evoked by Mr. Stringfellow's statement regarding the savings brought about by the use of modern industrial truck handling methods.

AUTOMATIC Transportation, with Ready Power gas-electric unit, traveling up-ender, with center control and front wheel drive. Picks up coils of strip metal up to 16,000 lb. weight and up-ends them.





YALE battery-powered 12,000 lb. capacity non-tilting center control ram truck with articulating frame; designed for heavy coiled strip handling.

These savings are the result of the application of the three laws of economy stated above, expressed in the use of industrial trucks of thoroughly modern design and construction. First, there has been accomplished a definite coordination of production and materials handling, with the result that the use efficiencies of both types of equipment have been made extraordinarily high, through careful planning and sound integration; second, rehandling has been eliminated to a marked degree by the use of materials handling equipment which not only carries its loads, but picks them up and sets them down unaided by external means; third, the loads are taken where they are needed, when they are needed, rapidly and dependably. As contrasted with former methods of handling, involving wastes of time, of energy, of labor and of machine utilization, the newer methods of handling have so integrated process with process that these wastes have been largely eliminated and machine use-efficiencies stepped up to practically ideal peaks. To place the value of these economies as affected by industrial trucks alone at between 150 and 250 millions of dollars, is, therefore, to make a very conservative statement indeed.

Truck Economics

For the purpose of comparing relative costs of the use of one system of materials handling with another, it is advisable to consider two classes of expense, direct and indirect. For battery operated trucks these two classes

may be analyzed somewhat as follows:

A—Direct Costs. The first direct cost is that of investment, or the expense involved in purchasing and installing the equipment. Accountants have agreed that the best way to compare two investments is to put down, side by side, the fixed charges involved annually. The first item of fixed charge on any investment is interest, or the cost of using the actual money involved; the second item is depreciation, or the amount which should be set aside each year to amortize the investment by the time the equipment

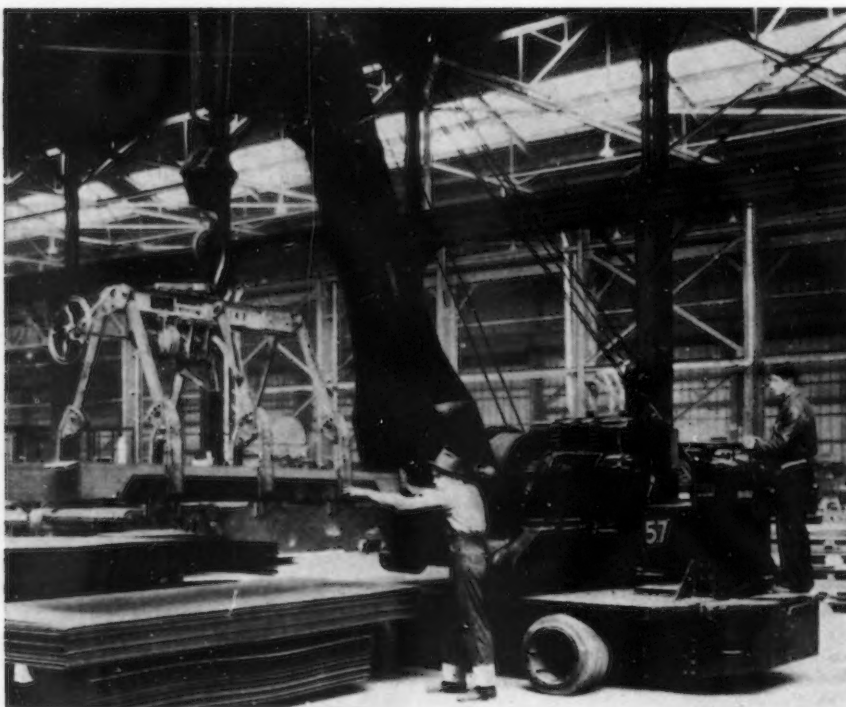
is used up; the third item is insurance, or the premium paid to provide protection against loss of the use of the equipment due to accident, fire, or other mishap beyond the control of the owner; the fourth item is taxes, or the annual contribution to civilized society in return for the opportunity to make and market goods under the protection of the property rights conferred by government; and the fifth is storage charges, or the rental for the space used to house the equipment when installed.

While all these charges will vary with many factors peculiar to each particular problem, and no one set of figures will apply to any two situations, an example may be worked out to illustrate the application of fixed charges in general. Assume a battery powered truck with an initial cost of \$3,000, requiring batteries costing \$500 each and charging equipment costing \$300, to be in service 24 hr. a day, 6 days a week. It will be advisable to have three batteries, each of 10 hr. capacity, but changed every 8 hr. The actual investment will be \$4,800, and the fixed charges will probably run as follows:

(a) Interest is figured at the prevailing rate for the use of money in capital investments; say 6 per cent. But since a depreciation reserve is being built up year by year to amortize that investment, interest on that reserve as it accumulates should be credited against the interest charged for the invested money. A complicated actuarial formula is required to determine this precisely, but for all prac-

HIGH-LIFT drop-platform battery-powered truck used with Truscon all-steel skids for handling large loads of light merchandise in warehousing service.





AUTOMATIC Transportation super-duty crane truck of 15,000 lb. capacity, equipped with special sheet-metal grab. A large Ready-Power gas-electric unit furnishes power for all drives.

tical purposes it amounts to one-half the first interest charge. Therefore, it is usual to take as the interest fixed charge on the investment, one-half the prevailing rate, or say 3 per cent.

(b) Depreciation is figured as the total cost of the equipment divided by the life expectancy of the equipment in years. Trucks may be estimated, in 24 hr. service at 10 years maximum; batteries at from 18 months to three years or more; charging equipment at 15 to 20 years.

(c) Insurance, taxes and storage are variables which, for ordinary estimating purposes are usually taken together as a flat 4 per cent of the total investment.

Operating Charges

(d) Power. This includes the kilowatt-hours of energy required to keep the batteries fully charged, and any labor costs involved in attendance on the charging panel. It may be assumed here that the average energy cost will run about 2c. per kwhr., and that for the batteries involved in this example the total current use amounts to about 100 kwhr. per 24-hr. day. It is also assumed that changing the batteries and putting the used battery on the line three times each day will take a total of about one-half hour per day of the combined time of the truck operator and a skilled electrical charging panel attendant.

(e) Maintenance. Costs of maintenance of the truck, batteries and charging equipment will include oil, grease, distilled water, small parts, tire replacements, periodic inspections and minor repairs. Major replacements or

rebuilding should be regarded as a charge against the depreciation reserve, as they will increase the life of the truck.

(f) Labor. This is the cost of the truck operator, and may vary from the wages of an unskilled laborer who manifests an aptitude for truck handling to a semi-skilled operator.

Putting the above example into tabular form, we get these figures for the cost of one year's operation:

Fixed Charges:

(a) Interest, 3 per cent on \$4,800	\$ 144.00
(b) Depreciation on truck, 10 year life	300.00
Depreciation on batteries, 3 year life	500.00
Depreciation on charger, 20 year life	15.00
(c) Insurance, taxes and storage, 4 per cent on \$4,800	192.00

Operating Charges:

(d) Power, 100 kwhr. × 300 days × 0.02	600.00
(e) Maintenance and repairs, average	300.00
Labor attendance at charging panel, 150 hr., \$1.00	150.00
(e) Operator, semi-skilled, 7200 hrs., 0.65	4,680.00

Total cost to use equipment for one year \$6,881.00

AUTOMATIC Transportation battery - powered center control telescoping fork truck for heavy duty handling and stacking to exceptional heights. Capacities up to 10,000 lbs.



Since this is figured on the basis of 7200-hr. work-year, the cost per hour of use figures at 95½c. per hr.; of which 65c. goes for operator's wages and 30c. for the "wages" of mechanical equipment.

Assume that the average load handled by this truck amounts to 4000 lb., that load-carrying hauls consume 30 per cent of the time (the balance being used in loading, discharging, and in no-load return trips), and that the average speed from loading to discharge point on payload hauls is four miles per hr.; then the total payload use figures out at 17,280 ton-miles, at a cost of about 34c. per ton-mile hauled.

2—*Indirect Costs.* These are difficult to determine in most cases. The principal sources are the costs of providing adequate aisles, passage ways and ramps for truck operation if these do not already exist; the costs of maintaining the surfaces of such aisles, passageways and ramps under the pounding of truck-travel; and the possible re-location of machines and storage and shipping facilities to accommodate the needs of a coordinated

system of handling. Such items should, of course, be estimated as carefully as possible, and debited equally with direct costs in calculating the total expense of installing a mobile industrial truck system of handling. All plant maintenance charges due to truck operation, and the costs entailed in lost production during the changeover of systems of handling should be charged in, while interest should be likewise charged on whatever plant changes are made necessary by the new system.

Estimating Savings

Against the total of direct and indirect costs of a truck system should be credited the savings in costs effected by the use of that system. First, of course, should be the comparison of the direct costs of the present system of handling with the estimated costs of the new truck system. This, however, does not tell the whole story. There will be indirect savings to be contrasted with the indirect costs. Although very difficult to evaluate, a careful study will generally show that these items will have a decided influence on final production costs:

1. Decrease in interest charges and insurance on manufacturing and storage facilities.
2. Decrease in interest and insurance charges on inventories.
3. Decrease in labor burden and managerial overhead.
4. Decrease in idle hours of machines and workers.
5. Decrease in charges for spoilage of goods.
6. Decrease in hazards to workmen.
7. Decrease in expenditures due to labor turnover.
8. Adaptability of the system to growth in plant capacity.

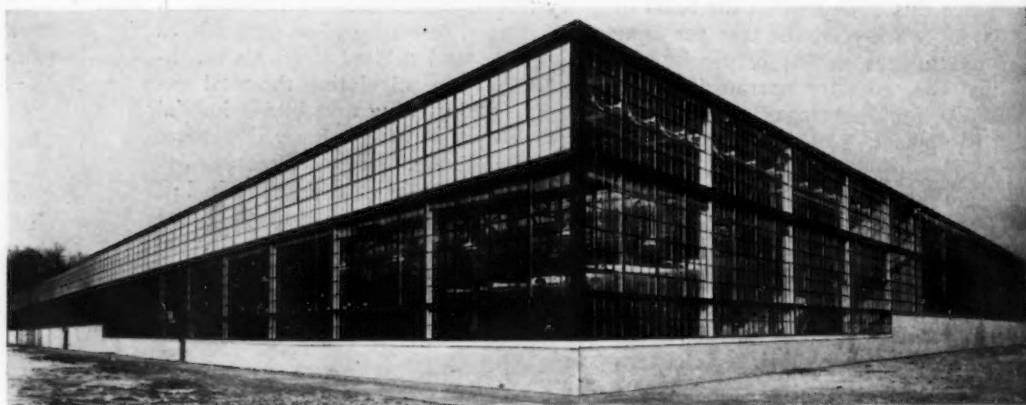
In the case of gasoline powered trucks it has sometimes been claimed that fixed charges are less than in the case of a comparable piece of battery powered equipment, but that operating costs are more. While this may be true in certain cases, there is reason to doubt its universal application, especially for gasoline-electric units.

(A later article in this series will continue this discussion of economics, with figures from a number of actual case-studies.)

• • •
ALTERNATING - CURRENT arc welding was used to fuse all of the steel framework of a building on the new office structure at the Westinghouse Electric & Mfg. Co.'s transformer works in Sharon, Pa. A helmeted welder is shown at work on one of the building columns.



THE new 115,000-sq.-ft. factory recently completed for the Detroit Diesel Engine Division of General Motors. The new plant, which measures approximately 480 x 240 ft., is situated on a 75-acre plot near the western border of the city.



Precision Raised to Nth

GENERAL MOTORS CORP. has begun a program for the manufacture of a complete line of new lightweight, two-cycle diesel engines. General Motors has been making large size two-cycle diesels for streamline trains and in marine service during the past four years. These engines have ranged from 600 to 1200 hp. New products now extend this line in varying sizes down to a one-cylinder 22-hp. model.

The complete line of engines will be built in one existing factory and two new factories, one of which, the Detroit Diesel Engine Division of General Motors Corp., at Detroit, is in operation, and the other of which, the new engine factory of the Electro-Motive Corp.'s diesel locomotive plant at LaGrange, Ill., will be in operation within a few months. The existing factory is that of the Cleveland Diesel Engine Division of General Motors Corp., (formerly the Winton Engine Mfg. Corp.) at Cleveland.

The new Detroit plant is located on a 75-acre tract at the Pere Marquette Railroad and Outer Drive. The first unit is laid out for production of 50 engines per 8-hr. day. The development also includes the completion and opening of the new General Motors diesel laboratory in a distinctively modern building adjacent to the

Detroit manufacturing plant. This is the largest and most completely equipped laboratory for exclusive diesel study in the world.

Product Program

The product program includes three series of models, based on three different cylinder sizes, having 71, 223 and 503 cu. in. displacement per cylinder, respectively. The model 71 series will include one, three, four and six cylinder models rated from 22 to 160 hp. maximum at 1800 r.p.m. The model 223 series will include four, six and eight cylinder models rated for industrial and marine purposes at 200 to 400 hp. The larger series comprises eight, twelve and sixteen cylinder engines ranging from 600 to 1200 hp.

The model 71 series will be manufactured at the Detroit plant; the 223 series at the Cleveland plant and the large engines, which heretofore have been built at the Cleveland plant, will be made at the LaGrange plant, because the principal application of the large engines has been in the locomotives built at the LaGrange plant. The Cleveland plant also will continue to custom build engines for the marine field. The Cleveland plant will also make complete "power packages" for industrial and agricultural applications.

The Detroit plant is now producing four engines built around one basic cylinder size and design—a one-cylinder engine—a three-cylinder engine,

a four, and a six. Thus it is possible to produce in quantity, on the same machines, all of the parts of a cylinder such as the dry liner, piston, connecting rod, bearings, etc., and then assemble these standard interchangeable elements into multi-cylinder engines. From the very start in the design of these products, production men have had the privilege of criticizing the original design and of making suggestions that would expedite manufacturing operations as well as to achieve economies and high quality.

Factory Building

The factory proper consists of a monitor-type structure, 240 ft. in width and 480 ft. in length. It has a maximum of window glass area. Worker comfort is further enhanced by the use of high ceilings, spacious work places and aisles, and excellent paint treatment that serves to reflect and make the most of the daylight.

The largest area is devoted to the machine lines for producing the major parts of the engine. Next is the experimental machine shop in which are built experimental engines for future development. Finally at the far end of the building is the injector department which manufactures and tests all fuel injectors used on all GM diesel engines wherever they are produced.

Adjacent to the machine shop is the engine assembly line, running at right angles to machine lines, and ad-



THE new diesel test laboratory measures 223 ft. in length and 105 ft. in width and is so constructed that the noise and vibration of powerful engines undergoing test inside are practically eliminated.

Degree At GM Diesel Plant

joining this is the final dynamometer test department. The electrical equipment is so arranged as to transmit the power of the engines on test to the main power plant for plant use.

Precision operations are keynoted in the machine shop. Here will be found the most modern of the precision boring machines, diamond-boring machines, centerless grinders, honing machines, and similar equipment associated with precision manufacture. One of the most important of the precision operations is that of producing piston and connecting rod assemblies. Contrary to general automotive practice, selective assembly is not used. Instead, each of the parts is made interchangeable as to size and weight. This is achieved by the use of ingenious machines which automatically weigh the piston or the rod and machine it precisely to the weight required.

Outer diameters of pistons and cylinder liners are finished on centerless grinders to close limits both as to size and surface quality. Connecting rods are precision-bored and are subsequently honed.

Interchangeable Engine Parts

Interchangeability finds its best expression in the machine lines for the large units such as cylinder blocks and heads. Here is an excellent example of the coordination of engineering design and production planning. Cylinder blocks and cylinder heads

are geometrically similar for all sizes and end-for-end. The drilling of the top and bottom is the same except for the fact that a larger block will have more holes. This basic design makes it possible to use but one line of special machines for the entire range of engines, regardless of the number of cylinders. It is possible to use many fixtures interchangeably and utilize multiple-spindle drilling and tapping heads without change.

For boring the dry cylinder liners, for example, the liners are assembled, three at a time, into a huge fixture which has the same form and size as a three-cylinder, cylinder block. Then the fixture goes into the same machine used for boring the cylinder barrels. The only change required is to replace the boring cutters with cutters of smaller diameter.

The blower department is characterized by the simplicity of equipment and process for intricate and precise operations. For example, the blower housing has two bores that must be finished to accurate limits. This is done by rough boring the housing on a single-end precision boring machine with massive boring spindle. As one bore is finished, the table indexes the work forward, hydraulically, to complete the second bore. Subsequently, each housing is processed in the same machine for a finishing boring operation.

The blower rotor is a three-lobed affair, each lobe having a spiral form

along its axis. There is one specially designed set-up to machine this piece automatically. It takes three separate settings of the rotor to complete the job, using a special formed cutter that encompasses a third of the profile each time. As the cutter traverses the face of the rotor, the rotor casting is automatically indexed so as to produce the spiral form. After machining, each rotor goes to balancing machine, where it is checked and drilled if necessary to produce balance.

Crankshafts are checked 100 per cent for static and dynamic balance using the standard GMR balancing machine. The same machine also is used for balancing flywheels.

The plant also has a modern and well-equipped heat treating department together with a metallurgical laboratory.

Extreme Precision Attained

The precision manufacturing department—in a niche all its own—produces the fuel injectors for all diesel engines built by General Motors. In its present form it represents the hitherto unattainable objective of translating the skill of the instrument maker into unbelievably precise manufacturing limits on interchangeable and reproducible parts. The maximum clearance between the barrel or bore

of the injector and the plunger, for example, must not exceed 50 millionths of an inch. At the tip end of the injector, the maximum clearance between the needle valve and its bore must be less than 0.0001 in.

All parts are measured by Electro-

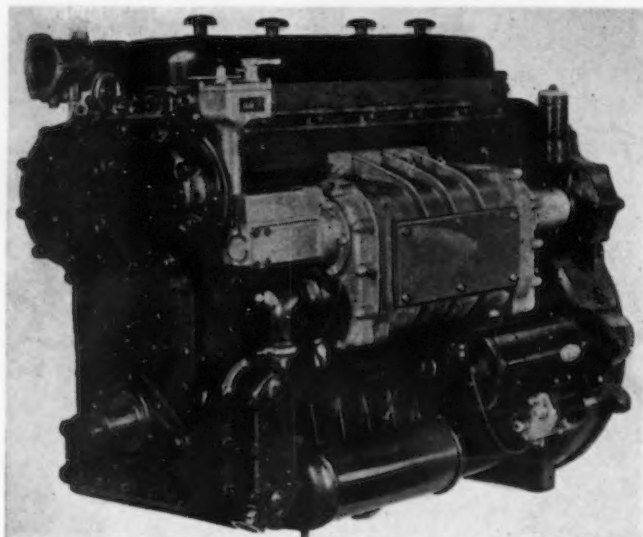
test department in which each injector is tested individually and calibrated according to specifications by exact laboratory procedure.

Finally, it is worth noting that all precision grinding operations on injector elements are performed in a

tors, is the modernistically-styled laboratory building erected adjacent to the Detroit Diesel Engine Division plant. Following the pattern of planning in other departments of the new diesel organization, the laboratory has been designed as a central testing set-up, serving all diesel engine divisions of the corporation. Consequently, its equipment includes facilities for testing all sizes of engines from the very smallest to the largest. In excess of 4000 hp. will be in continuous operation in the building.

The building proper is about 105 ft. wide and 223 ft. deep at its widest section. It is of vibrated concrete construction with a rounded modernistically-styled front office entrance. The latter is two stories in height. It is unique in the fact that it combines the functions of a self-contained power plant serving both the laboratory and factory with heat and power, together with unparalleled testing facilities.

One of the problems of testing lab-



AT LEFT
A SIX-CYLINDER version of the General Motors Model 71, two-cycle diesel engines. Unit construction enables engines of one to six cylinders to be manufactured on a unit plan.

BELOW
HIGH windows, modern lighting fixtures and ample spacing of drawing boards make the engineering department a model work place.

limit gages accurate to the millionth part of an inch. One-ten-thousandth of an inch is shown on a scale some 5 in. in length. Up to the present time such precision has been unheard of in mass production. This organization had to design much of its own production equipment and build it in accordance with the experience gained by many years of research and experimental production.

Another big problem was the matter of drilling the spray nozzle holes. These holes are of various diameters, depending upon the size of the engine. The general range lies between 0.006 and 0.014 in. in diameter. Drilling is done by means of tiny drilling machines designed here, in which the drill is rotated at extremely high speeds by means of air turbines. The drill spindle floats and is pressed into the work by the operator's finger. All of the internal parts and bushings are lapped by hand in a battery of special lapping machines both for internal and external parts.

In another section of this department is the assembly line for the small engine injectors, as well as benches for assembly of large units. Before leaving this department, each injector is tested first on a machine which tests its seal under pressure of 5,000 lb. per sq. in.; then on another machine that "pops" the nozzle to assure clear passages. The final step is the

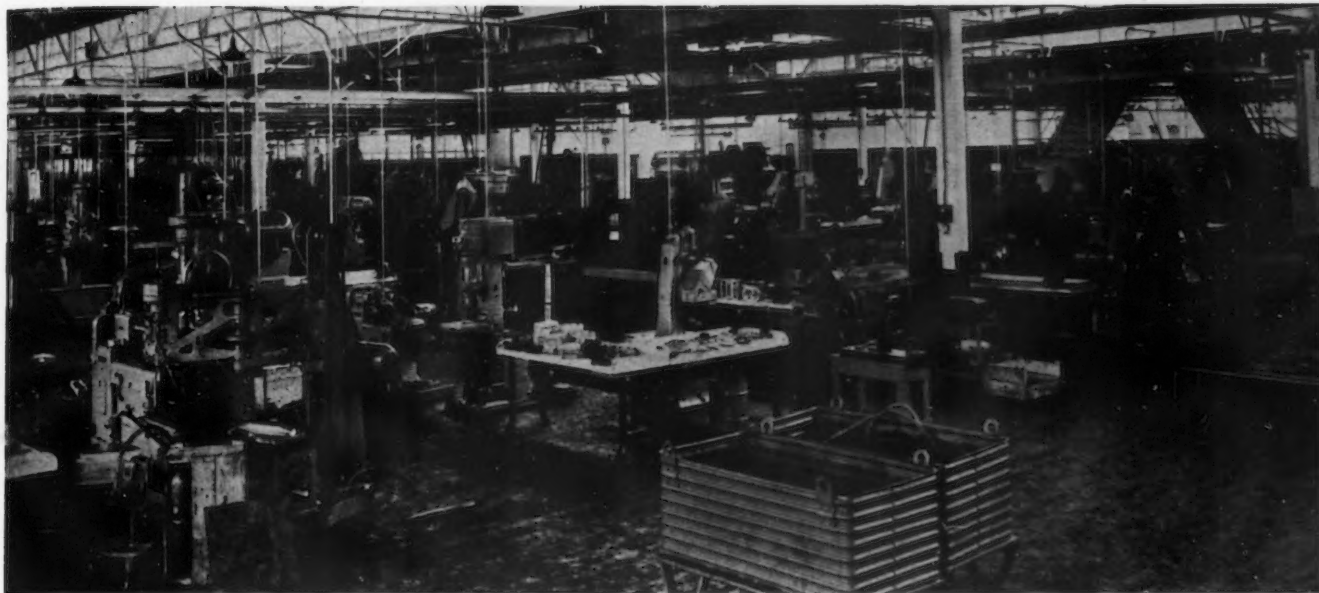


centralized grinding department, located in the precision machining department but completely isolated from it. This is done for two reasons: It keeps the precision grinding department free of dust, and it protects the precise drilling and lapping operations in the other department from the fine dust and grit that may originate from the grinding wheels.

New Diesel Laboratory

Rounding out the diesel engine manufacturing facilities of General Mo-

toratories for high speed engines is the insurance that recordings of the delicate measuring instruments are not affected by engine noise or vibration. Profiting by the experience of other large-scale laboratories and taking advantage of the latest scientific discoveries in the field of acoustics, the designers have created here a set-up in which noise and vibration are so subdued that it may be said they are completely under control. Not only have the designers eliminated the



AN overall view of the manufacturing area devoted to the production of one, three, four and six-cylinder engines in the new daylight diesel engine factory of General Motors. Not shown in this view are the high ceilings and the amount of space devoted to windows, with light-reflecting treatment accorded to the roof and structural steel framework.

chance of the measuring instruments being affected, but they have made it possible for the engineers who are observing a particular engine to be entirely free of the distraction or possibility of error that lies in hearing or feeling the operation of another nearby engine or the combined effects of a number of engines running at once.

The ground is marshy and the entire building rests on concrete-steel piles driven 75 ft. below the surface, thus providing a resilient dampening cushion. In addition, each engine foundation rests on an individual concrete platform with its own set of piles extending into the ground. Consequently, every piece of equipment in which there is motion is effectively isolated from the building and other units.

Normal engine noises are held to an almost unheard of level by the use of soundproofed and sound ab-

sorbing wall and ceiling surfaces. To prevent noise from escaping to the outside, the ordinary type of window has been supplanted with fixed sections of ornamental, translucent glass brick. Finally, to insure that the exhaust noises are eliminated the exhaust lines are led to huge concrete muffler stacks for each dynamometer room.

Since the dynamometer section is completely sealed, it is served by a modern ventilating system which distributes clean air in each work-space and is capable of changing the air completely several times a minute. Heat is supplied by ceiling-mounted unit heaters.

The feature of the laboratory is its group of eight test rooms, each one fitted with the modern dynamometer equipment and complete instrumentation for precise recording of scientific measurements of engine characteristics. As noted earlier, this laboratory coordinates the fundamental test

work for all GM diesel activities, and for this reason, rating and size of dynamometers in each department differs according to its function.

There is also an experimental assembly department. All new and experimental engines are designed at the central engineering department, while component parts are built in the experimental machine shop. Then the various engine components are transported to the laboratory where the experimental engines are assembled, adjusted and tuned in the assembly department.

The entire laboratory section is served by a service tunnel in the floor, carrying the fuel, oil, water, air and waste lines. Each room has a smaller service tunnel which feeds from the main line. Connecting the laboratory building with the main factory building is a large service tunnel or subway which conducts the various supply lines to the main plant.

TYPICAL of the best in modern factory construction is the light and clean locker and wash room. Showers are adjacent.



Welding Marches On*

By W. SPRARAGEN
*Technical Secretary,
American Welding Society*

NOW that welding is available as a tool for fabrication, there is a definite possibility that inclined stiffeners can be detailed and placed as economically as vertical ones in girder construction. A test at one university, under the auspices of the Welding Research Committee, proved that putting the stiffeners to work by inclining them in the direction of the compressive stresses in the web of the girder increases materially the strength of the girder.

Aluminum Alloys

Over 100,000 welded aluminum barrels for shipping beer now are in ser-

*Concluding section of article reviewing welding developments last year. First and second parts appeared in issues of Jan. 6 and 20.

vice. One of these barrels may actually be picked up with one finger. Welded construction has found new applications in the chemical, dairy, and rayon industries. Technique and field methods for fabricating large aluminum vessels have been developed and tanks up to 28 ft. in diameter, 30 ft. high, are being produced. Methods have also been devised for welding vessels up to 1-in. thick. These limits have been achieved under production conditions and it is now apparent that even larger and heavier equipment can be produced to carry greater loads or pressures.

Aluminum foil 0.002 in. thick is being seam welded in production. In

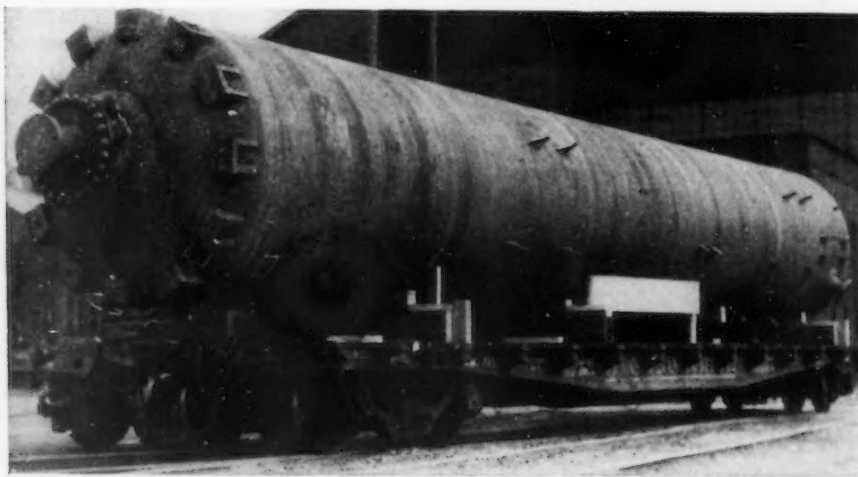
another case, a machine to make up 24 spot welds in one operation of the machine and timer has been developed. An interesting development is the welding of aluminum to copper. This combination of metals is used for fusing heavy-duty electrical circuits and in the construction of high-speed rotary electrical equipment where use of aluminum parts reduced centrifugal stresses. A connection must be made to the copper current distribution system on such equipment and a butt welded joint has been found to be a satisfactory solution.

Housing

During the past year, the much discussed steel frame dwelling house became an important development. Some of these homes are prefabricated. Sections and even whole houses are prefabricated in the factory, many of the systems using welded construction. In others, steel framing arrives on the building lot along with bricks, stone, wood flooring and other acceptable building materials. Welding and cutting are generally the accepted methods of fabrication of these steel framings. The steel brings protection against fire and termites, does not shrink, warp or sag.

Railroads

Welding continues to save the railroads literally millions of dollars each year. In an address made last sum-



REACTION chamber made of carbon-molybdenum steel and destined for high-temperature service in the oil industry. Dimensions are: 8 ft. I.D. x 1 13/16 in. x 50 ft. straight shell length. The vessel was constructed to API-ASME code, stress relieved and X-rayed. (Photo by courtesy of Babcock & Wilcox Co.)

mer, L. W. Wallace, director of equipment research, Association of American Railroads, cited the work of one railroad which alone saved \$58,500 by renewing worn parts on truck side frames, and \$117,000 on truck bolsters.

Cars

Last year witnessed a remarkable development in welded railroad cars—hopper, box, tank, and passenger. With the rapid advance of welding in standard and light weight car construction, welding designs and techniques have been improved. Waviness or buckles are no longer tolerated.

An interesting large tonnage application of high-tensile low-alloy steels in this field was in the construction of 500 automobile-type box cars by the Chicago, Milwaukee, St. Paul & Pacific Railroad Co. In these the side sheets vary from the usual construction in that instead of being sheets fastened to the car in a vertical position longways, the sides are made of 21-in. wide strips laid in a horizontal position and running continuous from door posts to corner posts. The lower edge of six of the strips has a corrugation rolled in and is lapped over and spot welded to the next lower sheet. The bottom sheet has a simple offset rolled on the lower edge to lap over the vertical flange on the bottom chord.

The steel analyses approximately 0.09 per cent carbon, 0.70 manganese, 1.40 copper, 0.90 nickel, and 0.10 per cent molybdenum. Average physical properties of sheets and strips are: Tensile strength, 75,000 lb. per sq. in. and yield point, 60,000 lb. per sq. in. The horizontal bands improve the appearance of the car and add considerable strength to the side itself.

Another interesting application was the production of low alloy steel lightweight passenger car roofs at the plant of the Pullman Standard Car Mfg. Co. Light-weight Z-sections, termed roof stiffeners or purlins, run longitudinally between cross members known as car lines. These are spot welded to the roof sheets before applying the roof sheets to the car. The steel used is of the same analysis as that for the Milwaukee box car sections. The completed job is smooth in appearance and especially strong and water tight.

Locomotive Boiler Welding

What is believed to be the first high-pressure boiler ever made with welded barrel and dome, under U-68 (class I) rules of the A.S.M.E. code for fusion



FABRICATING low alloy steel lightweight passenger car roofs by means of a roller series type welder. The 16 gage sheets run crossways over the roof of the car, form a line above the windows on one side to the same position on the opposite side and are spot welded to wing channel section car lines, which are cold pressed from strip steel. (Photos by courtesy Pullman Standard Car Mfg. Co. and Republic Steel Corp.)

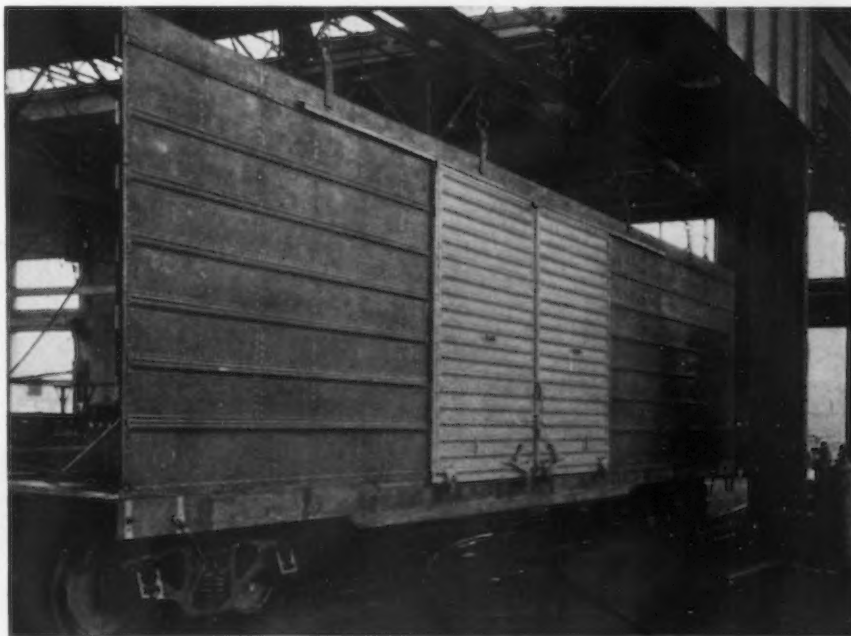
welded vessels, was recently completed by Farrar & Trefts, Inc., Buffalo.

The boiler is of locomotive type and is for use in the oil fields. The barrel is 16½ ft. long, 62½ in. in outside diameter and is made of 1.15-in. thick steel plate, electrically welded by the shielded arc process. Welded construction of the barrel eliminated a large amount of caulking of seams, and in remaining permanently tight, the welded

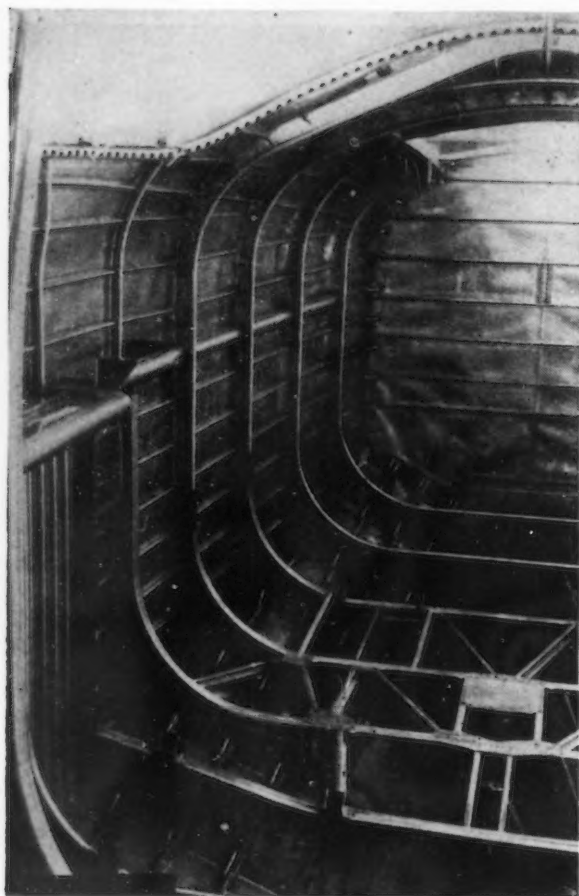
seams assure freedom from maintenance. The two longitudinal welds of the barrel were hammer tested at 575 lb. and leak tested at 700 lb. hydrostatic pressure.

Rail Welding

A railroad track without joints has been a pipe dream of way engineers for the past 20 years, but the last few years has seen this dream become a



ONE of the 500 automobile type box cars being built in the shops of the Chicago, Milwaukee, St. Paul & Pacific Railroad Co. This view shows one of the sides in position on the frame before adding the end and roof. The sides complete with the exception of the doors are of high tensile steel strip in formed sections. The top plates, vertical posts and bottom chord members were rolled from coils on a cold forming mill. The entire side assemblies were put together by means of a series spot welder. (Photo by courtesy Chicago, Milwaukee, St. Paul & Pacific Railroad Co. and the Republic Steel Corp.)



AT LEFT

INTERIOR of the weld-fabricated hull of the Fleetwings, Inc., model F5 SEA BIRD amphibian, showing flanges, stringers, and in the background the water-tight bulkhead.

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BELOW

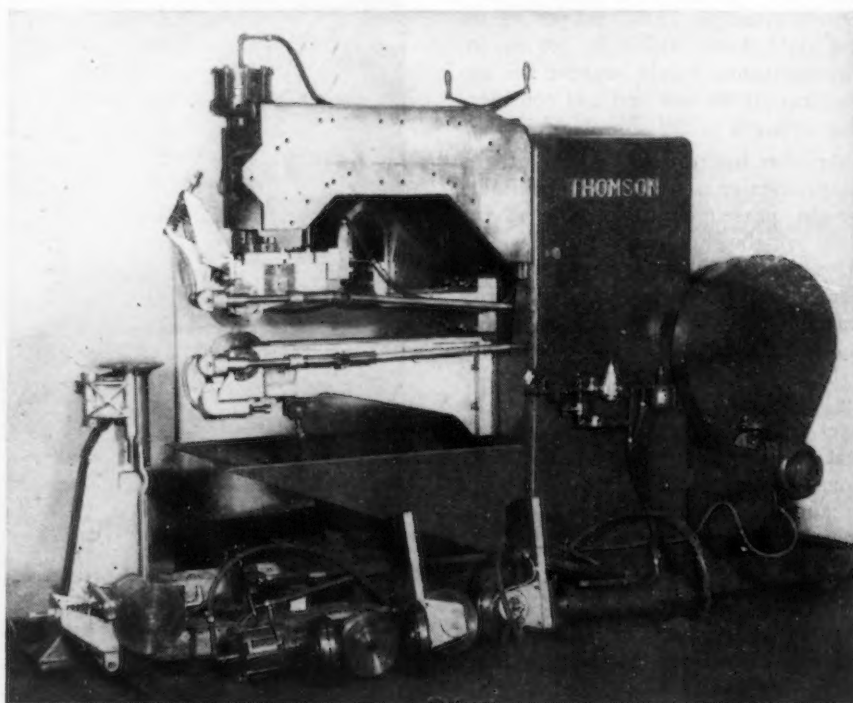
FLÉXIBLE type seam welder for aluminum and stainless steel. The set-up is for longitudinal welding, but by means of the alternate heads, arms and welding wheels shown in the foreground the machine may be converted for other kinds of seam welding. The machine is the Thomson Gibb "Super Universal."

reality. The welded rail joint eliminates joint maintenance entirely and improves electrical conductivity for signal and power circuits. Accepted methods are the Thermit pressure joint and the gas welded joint. During 1936 a new process entered the field. It consists of flash butt welding the ends of the rail together to form one long continuous rail. As in the other two methods, it is possible to use continuous rails more than a mile in length. Development of this resistance method is the result of considerable research and experimental work on the part of one railroad and two manufacturing companies.

When the conventional joint between two rails begins to wear, a low spot or depression is formed. The shock or impact of car wheels as they strike these low spots has an appreciable effect on the life of the rolling stock, adding considerably to maintenance costs. Thus, worn or battered rail ends have been a source of considerable expense to railroad operators. Such rails either have to be built up by welding or replaced, and either remedy is directly reflected in high maintenance costs.

The welding equipment as operated by Sperry Rail Service consists of a

generator car housing two turbine-generators; a rack car, which holds rails in tiers preparatory to welding; and a welding car, where the actual joining of the rails takes place. A



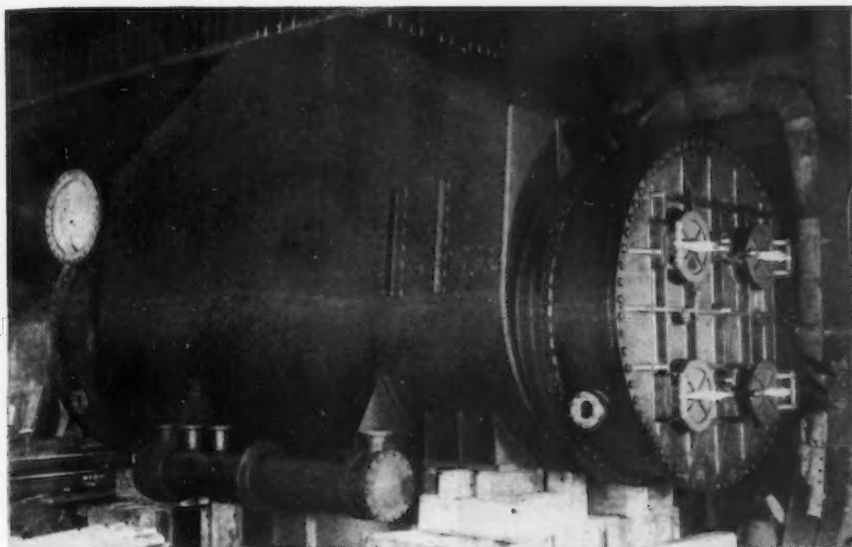
locomotive supplies steam to the turbine-generators.

Power rollers carry the rails from the rack car into the welding car. Here, the first step is preheating. One end of each of the two rails to be joined is clamped in a fixed position, while the other is allowed to remain movable. Current clamps are connected to a low-voltage transformer and the preheating is accomplished by intermittent short circuiting between the two faces. After preheating, the high spots on the rail ends are burned off by continuous short circuiting. After a predetermined amount of this "flashing," the faces are brought together under great pressure. The molten metal squeezes out and the butt weld is made between the plastic faces. The welded rail is then heated again to relieve stresses caused by welding and, finally, the weld is ground flush with the rail.

Welding in Dam Construction

Welding enables Army engineers who are building a 100,000,000 cu. yd. earth-fill dam across the Missouri River at Fort Peck, Mont., to keep a vast array of heavy equipment in operation despite breakdowns and wear from handling highly abrasive material.

On this huge and isolated project, far from sources of supplies and repairs, welding was adopted as a means of maintenance and at the peak of construction more than 123 men were employed as welders.



The largest number of problems arose in the maintenance of dredges with their pumps, cutters and impellers, and steam shovels, tractors and similar machinery. That part of the equipment which has been worn away is replaced by an application of a wear-resistant surfacing material. For the repair of worn dredge pump casings, the casing is heated to 800 deg. F. before the welding torch or arc is applied. The welder then builds up the worn area or repairs the cracks while the pump is hot. The results are said to be excellent. Some of these pump casings have been repaired by the application of weld metal and hard facing as many as seven times without any loss in pumping efficiency as compared with a new pump. Another place where welding has played an important part is in the construction of the core wall of the Dam. About 50,000 lineal ft. of welding was done on sheet piling $\frac{3}{8}$ in. thick.

Tanks

Large tanks are now welded. Approximately 90 per cent of oil storage tank shells of the conventional type and practically all special pressure tanks of spherical or other shapes are welded. Steel balloon roofs are some of the specialties which are daily being weld fabricated. Some of these rapid advances have been due to methods of assembly and holding shell plates without the use of fitting up holes and welding sequences which eliminate distortion.

Pressure Vessels

The past year has witnessed the installation of large 50,000 and 60,000

kw. steam electric generating units operating at 1200 lb. pressure and 950 deg. F. temperature made possible by using carbon molybdenum seamless tubing with all joints between boiler and turbine welded. Heat treatment is a necessary feature for the success of such structures. Welded pressure vessels for sub-zero temperatures as low as -150 deg. F. are no longer a rarity.

In Europe, fusion welded pressure

vessels have been built for 100,000 lb. per sq. in. minimum tensile strength.

Power Supply

For a time, the welding load was regarded by power companies with disfavor. This year one large public utility reports an annual revenue of some \$600,000 from welding.

Filler Metal Specifications

A filler metal that gives a weld with an ultimate tensile strength of 80,000 lb. per sq. in. with an elongation of 20 per cent in 2 in. is a good weld in any language. Yet these are the requirements of one grade of filler metal called for in the new A.W.S.-A.S.T.M Filler Metal Specifications issued this summer.

Welding Symbols

Realizing that welding cannot take its place as an engineering tool unless means are provided for conveying full information from designer to workmen, the American Welding Society has evolved and published a set of standard welding symbols covering both fusion and resistance welding.

What Is in Back of it All?

Undoubtedly the rapid advances in welding and cutting are due to their

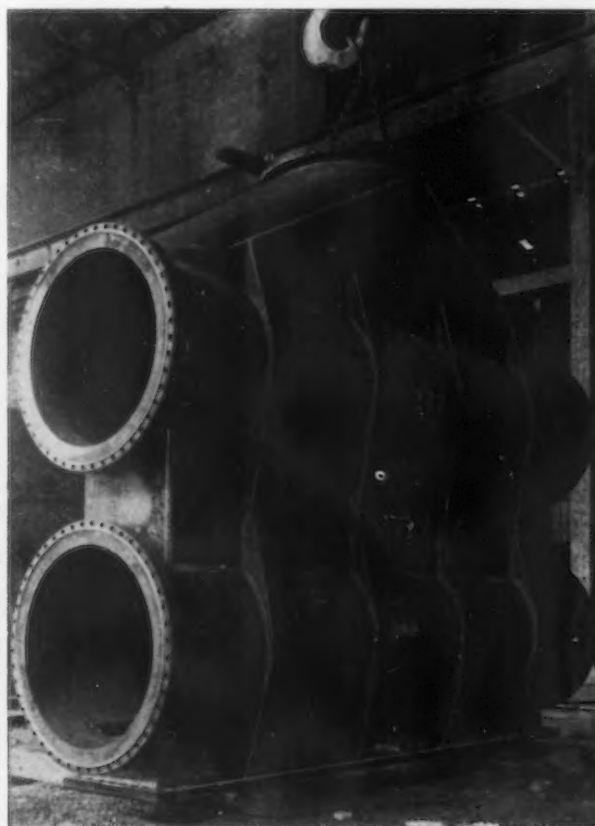
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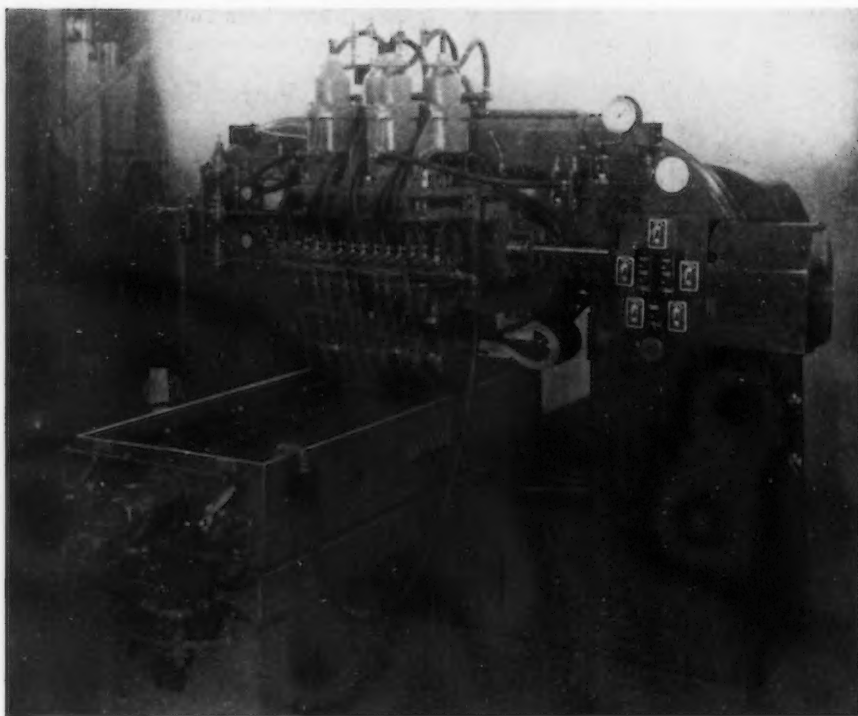
THE shell of this 13,000 sq. ft. two-pass condenser is of copper-bearing rolled steel, welded by a-c arc equipment. With this construction bolted joints between shell members are eliminated and a tighter and lighter assembly obtained. (Photo by courtesy Foster Wheeler Corp.)

o o o

AT RIGHT

PART of a special condenser unit of unusual construction, weld-fabricated by the M. W. Kellogg Co.





THIS special four roll series line welder was supplied by the National Electric Welding Machines Co. for welding automatically the 20 seams on large, fluted refrigerator condenser plates.

inherent advantages of applicability and economy, but that is not the whole story. In back of this progress lies the pioneering spirit of a new industry. Research men in manufacturing companies, universities and governmental departments are daily extending the frontiers of knowledge. This research for new facts, improvements and basic information is never-ending. Industry in general owes much to this pioneering spirit.

How many welding engineers of today recall the pronouncements of many

foremost metallurgists only two decades ago that a weld was a casting and to expect it to have anything but the physical properties of a casting was expecting the impossible—defiance of the laws of nature, as it were?

We know a great deal more about distortion and residual stresses and hardenability of certain steels due to the welding process, but much remains to be known. The Welding Research Committee of the Engineering Foundation compiles yearly some 50 or more outstanding research problems. Re-

search work on each brings us nearer to the truth but opens up dozens of new problems to be investigated and explored. Private research of industry is supplemented by university research, government research and the cooperative work of the Welding Research Committee of the Engineering Foundation, which is sponsored jointly by the American Welding Society and the American Institute of Electrical Engineers.

To young men who have a sound knowledge of metallurgy and a fundamental training in physics and chemistry opportunity beckons in this rapidly developing industry.

Sales Effort

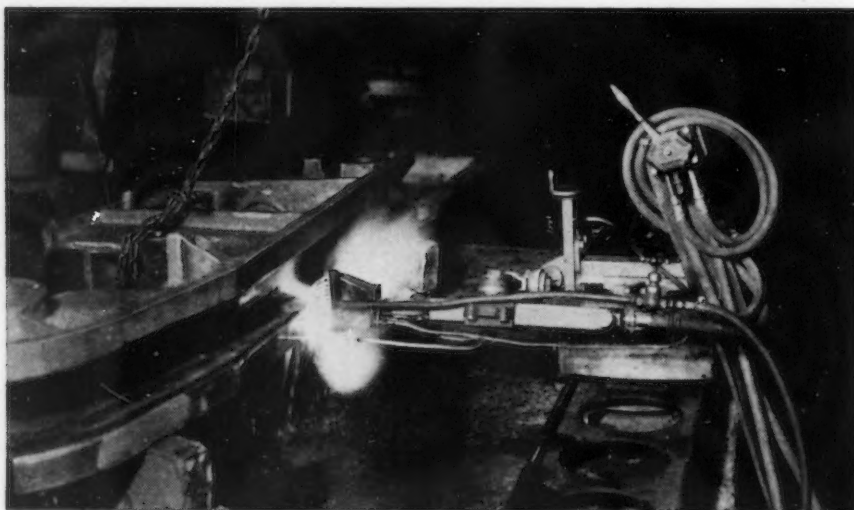
Even a few years ago it was necessary to "sell" welding. Conservative engineers were skeptical, and rightly so, but all this has changed. Welding techniques have been perfected. Design information is available. The qualifications of welders for important work is an accepted fact in all branches of industry. The methods of inspection and testing grow daily more effective.

Use of the X-ray and the Magna-flux method are boons to the welding industry. Danger points are quickly detected and remedied before they can do any damage.

Stress Raisers

This twin of trouble in the entire welding industry is not an unknown factor to the welding engineer. He knows that stress raisers must be avoided and eliminated where welds must be subjected to dynamic stresses. Sometimes the answer is not adding on more metal but actually taking it away. Sometimes these stress raisers are due to an abrupt change in metallurgical structure and then the answer may be heat-treating. We can all remember when welds were classed as unreliable, but now in practically all aircraft construction where reliability is the watchword welding has come into its own. They now weld where safety is of absolute importance.

Small wonder then that the attitude of the welding industry has changed from one of selling to one of safety. Codes and specifications are rigid in their requirements because experience has taught that these rigid requirements are necessary and they can be made economical through proper design, selection of material, suitable techniques, qualified welders and perfected inspection and testing methods. **Welding Marches On!**



OXY-ACETYLENE process employed in progressive flame hardening of conveyor rails. (Photo by courtesy Linde Air Products Co.)

Machining Housings To Reduce Axle Gear Noise



FINAL inspection of differential gear case in Pontiac's new axle plant, following simultaneous machining of pinion and cross bores.

ACCURACY in gear manufacture alone, does not insure quiet rear axle gears. The best gears may be noisy if mountings are not accurately machined in the housing itself.

To insure absolute accuracy Pontiac Motor Division of General Motors not only installed the latest in gear production equipment recently, but also set up its machining operations on the differential carrier and differential case for close tolerance production.

A feature in the machining of the differential carrier is the use of a new three-way boring machine which finishes the bores for the two differential carrier bearings and the pinion bore. By performing all three operations in one set-up, chances for misalignment due to setting the part up on different machines is eliminated.

In this operation the differential carrier is located from two drilled and reamed bolt holes and the face of the carrier on an Ex-Cell-O three-way boring machine. Cutting is with tungsten carbide tipped tools to minimize wear on the tools themselves.

One hundred per cent inspection follows this operation. Pin to cross-bore relationship is held to 0.001 in. above or below. In production the carriers run within 0.0002 in. for squareness in seven inches—even closer than specified by engineering drawings. Each bearing hole is inspected with a Swedish gage reading to 0.0001 in., with a specified tolerance of 0.001 in.

Production on these three-way machines is at the rate of 60 carriers

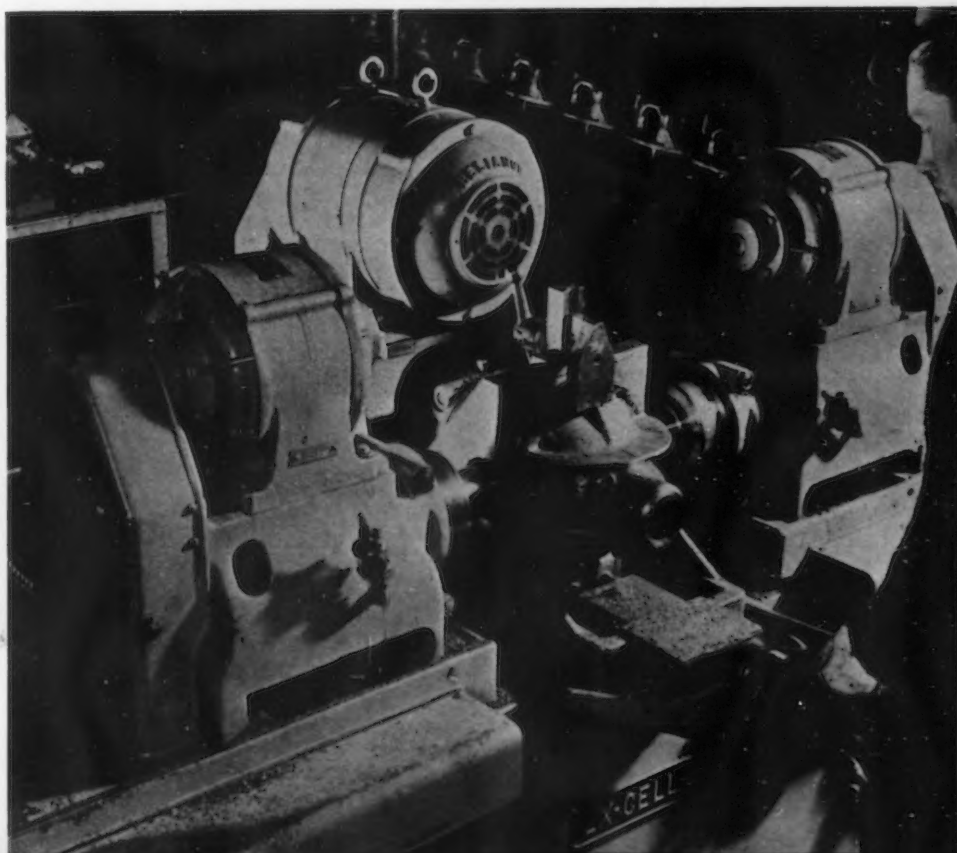
per hr. The machines themselves are of a new type, completely automatic in cycle. A feature of the machine is the provision of tapered plates which permit ready adjustment of the boring spindles for height in case of the slightest wear on the machine ways.

To go with this accurate machining

of the differential carrier, pinion shanks are ground and lapped to size within plus or minus one-tenth.

So accurate has this production process proven that since its installation not a single axle has had to be pulled out for adjustment from under an assembled car after final inspection for quietness.

EX-CELL-O Machines in new Pontiac axle plant which perform both cross bore and pinion bore at the same setting.



Better Control of Heat Treating and Other Processes Given by New Instruments

By FRANK J. OLIVER
Associate Editor, *The Iron Age*

o o o

DURING the past several months, numerous pieces of measuring, controlling and recording apparatus have been placed on the market to make more accurate and simplify process control, whether it be heat-treating operations, baking or drying or other industrial applications. In several instances, equipment that has been proved out in one field is being extended and adapted to others.

The *Taylor Instrument Co.*, of Rochester, N. Y., for example, has taken its well known Micromax recording and indicating potentiometer type of controller and combined it with its Motosteel diaphragm valve for process control work. It utilizes the same completely adjustable, air-operated control mechanism used in Taylor Fulscope temperature, pressure, rate of flow and liquid level controllers now in service. Where precision valve action, or both precision valve action and compensation for changes in load, may be necessary to prevent deviation from the control point, the Fulscope mechanism can be

supplemented with the Valv-Precisor or Dubl-Response control unit, respectively.

Where several temperature changes are recorded on a single chart, the lines often overlap, making reading difficult. To obviate this chance of error in reading, the *Brown Instrument Co.*, Philadelphia, has introduced a multiple-color numeral printing system in its potentiometer type recording pyrometers. Only one symbol, the plus sign (+), is used and the numeral identifies the thermocouple from which the temperature record is being made. The vertical line of the plus sign identifies the temperature and the horizontal line, the time co-ordinate. With a 12-in. wide chart, it is possible to record from two to six temperatures from as many thermocouples. This pyrometer has all the inherent features of standard Brown instruments, including the 40-in. slide wire, enclosed galvanometer and rugged drive mechanism.

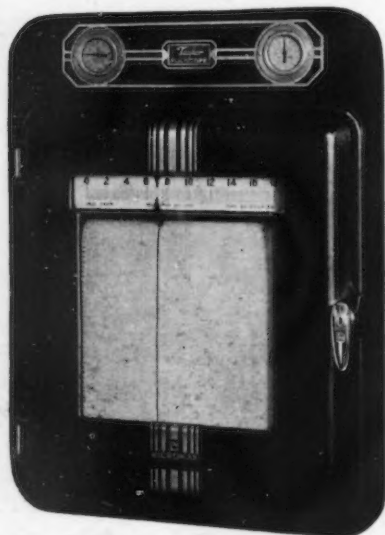
Through the development of improved processes, a newer form of renewable chart material for record-

ing meters is being marketed by the *Permochart Co.*, Koppers Bldg., Pittsburgh. The new Permochart is harder and stronger than the original material, resulting in a better writing surface, a cleaner pen line and longer life. With Permochart, each day's recording can be quickly removed with a damp cloth and the same chart used over and over again. Its life in ordinary service is guaranteed at two years. Thousands of designs are available to suit various chart requirements.

The same company has also developed a recording chart ink which has desirable quick-drying properties. It flows freely and will neither flood nor cake, according to the manufacturers. It gives uniformly clear and unfeathered lines.

Throttling Type Controllers

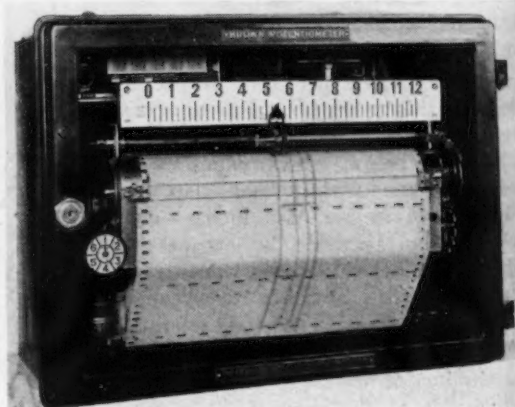
A new throttling potentiometer controller, known as model 4038 and designed to provide close temperature regulation for heat-treating furnaces and similar applications, has been introduced by the *Foxboro Co.*, Foxboro, Mass. The instrument regulates the position of a throttling valve to maintain the flow of fuel required to



AT LEFT
THE Taylor Micromax recording and indicating potentiometer type controller is now being combined with the Motosteel diaphragm valve for process control work.

o o o

AT RIGHT
THROUGH the use of a multiple-color numeral printing system, two to six temperatures may be recorded on a single chart without confusion on the Brown potentiometer.



hold the temperature constant, avoiding abrupt changes in fuel supply.

Operation of the unit is based on the familiar potentiometer pyrometer circuit, but utilizes a second slide wire for smooth operation. When the galvanometer pointer contact unbalances the bridge on a change of temperature, a relay causes a corresponding readjustment of the motor-operated valve, at the same time adjusting the slide wire contact to rebalance the bridge circuit. The change in the valve adjustment for a given deflection of the instrument is adjustable.

This type of temperature control is said to be particularly suitable for precise regulation of furnaces operating under fairly uniform conditions of loading, fuel pressure and B.t.u. value where a definite furnace temperature may be expected for each position of valve opening. A simple manual reset is provided to compensate for such periodic changes in operating conditions as may occur.

A different approach to the same problem of furnace temperature regulation is found in the "Alnor" pyrometer controller made by the *Illinois Testing Laboratories, Inc.*, 420 N. LaSalle Street, Chicago. In this instrument, the principle of operation is electronic. Temperature setting is effected by an adjustable target carrying two vanes or condenser plates. The pointer of the indicating pyrometer galvanometer also carries a vane edge-wise. The vanes constitute the capacitive element of a tuned circuit, and when the vanes of the pointer and target interleaf, a circuit change is produced which operates a relay. In the case of an electric furnace, the heating current is turned off, or for fuel fired operation, the fuel valve is closed partially. The latter may be of the solenoid or motorized type. Current amplification is obtained by vacuum tubes, easily replaceable. Should one burn out, the furnace is automatically shut off.

Still another throttling type of controller for electric furnaces is one just announced by the *C. J. Tagliabue Mfg. Co.*, Park & Nostrand Avenues, Brooklyn, in which the principle of design is photoelectric detection of the position of a light beam reflected from a mirror galvanometer toward a reciprocating "controlling edge." With this automatic controller, the heat supply is made to vary inversely with the temperature. The instrument has no measurable dead zone and holds a steady temperature. The throttling zone can be adjusted within wide limits and the "load error" kept within

DEVELOPMENTS in pyrometers and other temperature controllers of both the indicating and the recording types are reviewed, including descriptions of three throttling type furnace controllers of similar purpose, but entirely different design principles; also some interesting portable types of recording pyrometers. Other related items described are optical pyrometers of a precision type, a reversing cycle timer for soaking pits and open hearths, and a small gas-fired tool-room furnace. Part II of this review is devoted to electrical controls for motors and other industrial power applications. Next week, developments in machine tools in the past month will be surveyed.

a few degrees without appreciable hunting.

The circular scale and slide wire are 15 in. long and temperatures can be read within 0.1 per cent of the range. The scale appears through a window and temperatures are indicated by a brilliant white, red or green line of light on ground glass.

Portable Recording Pyrometers

A portable indicating and recording pyrometer of the potentiometer type has been added to the line of Pyromasters, made by the *Bristol Co.*, Waterbury, Conn. The instrument is unusually rugged, is not affected by

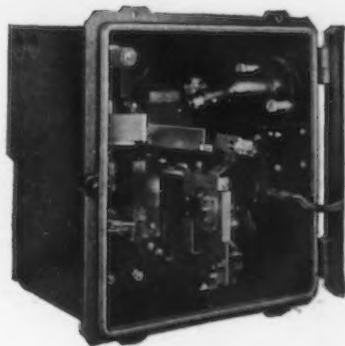
BELOW

THE "Celectray" throttling controller depends for its action upon the photoelectric detection of the position of a light beam reflected from a mirror galvanometer toward a reciprocating "controlling edge."

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AT RIGHT

IN this portable Bristol Pyromaster, the galvanometer is equipped with a highly damped coil which is free to move at any time.



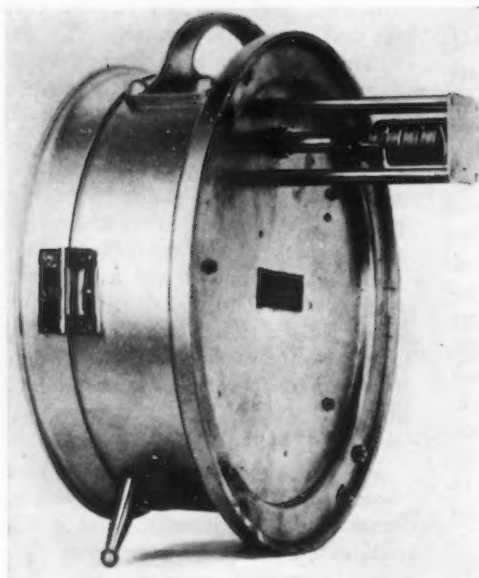
vibration and does not require careful leveling while in use. The galvanometer is equipped with a highly damped coil and is free to move at any time. When an unbalanced condition in the potentiometer circuit occurs, a series of relay-actuated switches operate a motor to position a slide wire contact to which the pen arm is mechanically connected. These portable instruments are available in ranges from 0 to 500 deg. up to 0 to 3000 deg. F. They are also available as resistance thermometers for ranges from 20 to 350 deg. The chart is 12 in. in diameter and is driven by a telechron clock.

A new portable recording thermometer for use in traveling baking, finishing and enameling ovens also has been developed by the *Bristol Co.* The instrument passes through the oven on the conveyor with the work and gives a continuous record of the temperatures to which the heated product is subjected. These thermometers are especially useful in large enameling ovens. They are also extensively used in ovens for treating the finish on automobile bodies. These instruments are light in weight, compact and self-contained. They record on an 8-in. round chart for 24-hour or 7-day clock rotation.

Non-Indicating Types

A new type of non-registering form of temperature controls has been added to the line of the *Burling Instrument Co.*, 241 Springfield Avenue, Newark, N. J. Known as model VD-2, this heat controller is equipped with two snap-action switches, instead of one, making it possible to obtain a two or three-step control. Each switch has

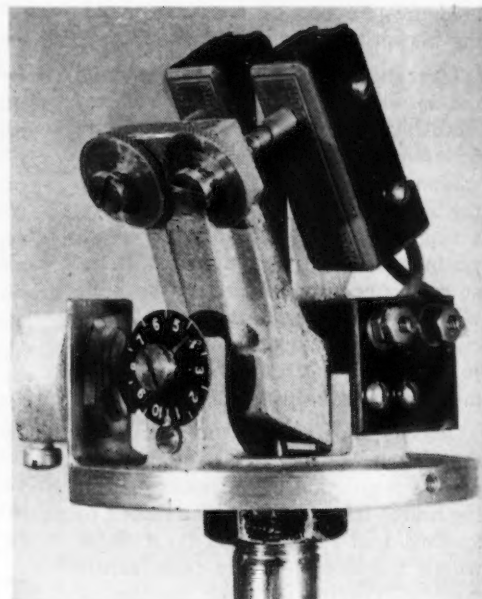




AT RIGHT
TWO snap-action switches in this Burling heat controller can give two or three-step control to furnace operation.

o o o

AT LEFT
THIS Bristol portable recording thermometer can be placed on the conveyor of an enamel baking oven to record the conditions to which the work is ordinarily subjected.



its own adjusting screw and there is a main adjusting lever with screw and dial for setting the instrument for the desired operating temperature. Inasmuch as either or both switches may be normally open or normally closed, a number of circuits can be worked out. A control having two normally closed switches could be arranged to have one heater cut out 20 deg. below the desired temperature, leaving the second switch to act as the controller, or one could be arranged for controlling the temperature and the other one for a low-temperature alarm.

The instrument is furnished with

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THE Weston indicating thermometer has a multiple coil bimetallic element.

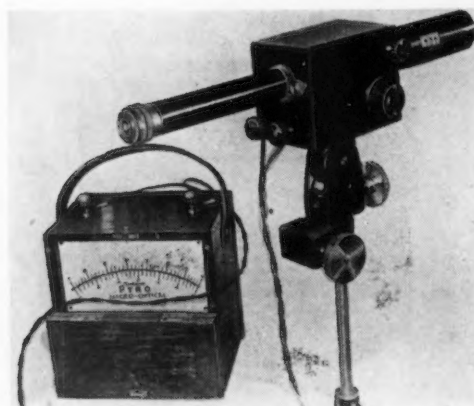


$\frac{3}{4}$ -in. heating tube in several lengths. Temperature range is up to 1400 deg. F.

The initial units in a line of industrial indicating thermometers have been introduced by the *Weston Electrical Instrument Corp.*, Newark, N. J. These new instruments are of the dial-and-pointer type, said to be the first industrial application of a new "coils-within-coils" design for the bimetallic temperature-sensitive element. This element is sheathed within a stainless steel stem, and the circular dial case, 3-in. in diameter, is mounted at right angles to the stem. Dial face is anodized aluminum. Accuracy is guaranteed to 1 per cent over the entire scale. Three models are being introduced for use in checking operating temperatures in industrial applications such as heaters, dryers,

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BELOW
A 20-FOLD magnification of the object makes this Pyro micro-optical pyrometer suitable for measuring the temperatures of very small objects, such as wire filaments.



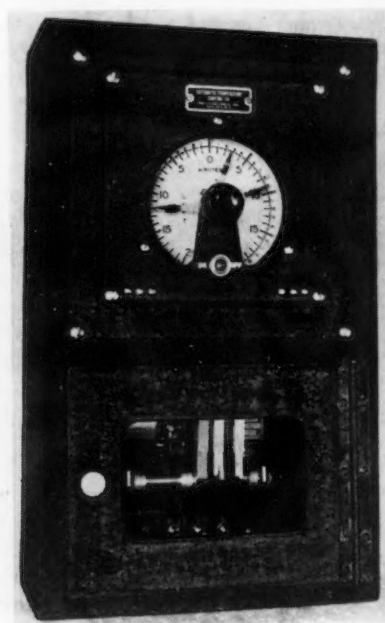
baking ovens, and small furnaces which have operating temperatures below 1000 deg. F.

Optical Pyrometers

The *Pyrometer Instrument Co.*, 103 Lafayette Street, New York, has developed a so-called "Bi-Optical" pyrometer, the measuring principle of which is based upon the use of light filters and color wedges which are transparent to a number of colors simultaneously. By using filters with a number of transparencies both for separation and for mixing and toning down, the creation of a surprisingly

o o o

ONE time-set dial in this ATC instrument gives alternating cycle control of furnaces fired at both ends, such as soaking pits and open hearths.



simple temperature measuring device in the form of colored disks is made possible. With the new Pyro Bi-Optical pyrometer, both the temperature of the "black body" and the "actual" temperature may be ascertained simultaneously. The instrument is furnished with scale ranges from about 900-1900 deg. C. or 1700-3500 deg. F. This new instrument may be used for laboratory and research applications, including incandescent iron and iron alloys in the open and flame heated furnaces.

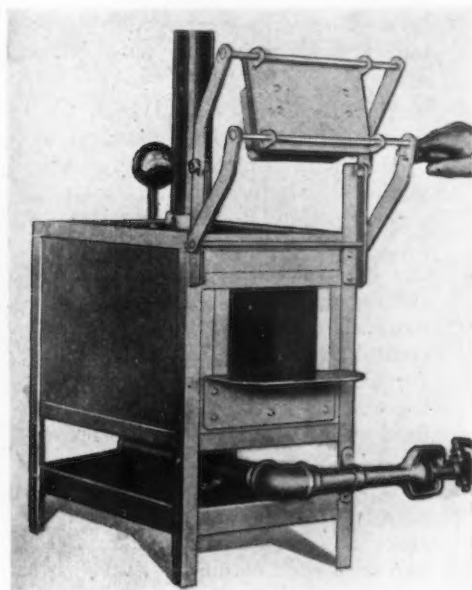
The same company has also placed on the market a new Pyro micro-optical pyrometer, a precision instru-

and others of the ATC line for the same general purpose is that one time-set dial is used in place of two. Choice between the two types depends upon job conditions.

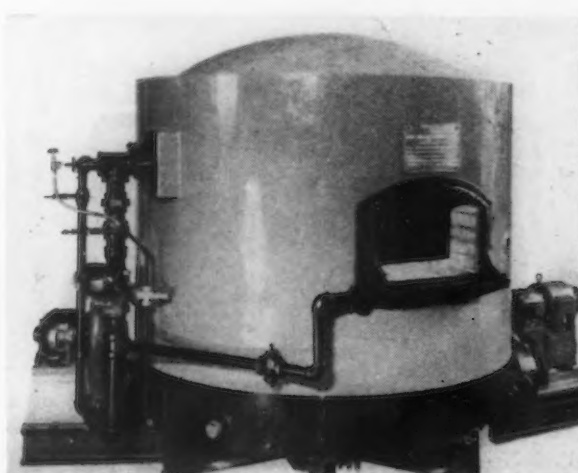
In the one-dial type, there are two preset pointers and one traveling pointer. When the latter strikes one of the preset pointers it reverses and comes back to 0 in the designated time. At 0, a contact is made which starts a cam timer, and the moving pointer continues its direction of movement until reversed by the second preset pointer. The cam timer controls two separate load circuits and starts the sequence of operations

cost of 1c. per hr. and reaches this temperature from cold in 15 min. The gas is burned in one long burner located below a slot in the furnace bottom. Refractory insulation is over 3 in. thick and the hearth floor is cast chrome-nickel. The No. 2 size has a chamber 6 x 12 in. and the No. 3 size, 8 x 8 in., both 6 in. high. A direct reading pyrometer is included. The units sell for under \$100.

The same company has also designed a hydrogen annealing furnace on the same basic design. Work is pushed into the furnace in trays and there is an extension in the rear which serves as a cooling chamber. Tem-



AT LEFT
TEMPERATURES
up to 1400 deg. F.
can be attained in
this Baker toolroom
furnace with a single
gas burner.



GAS MACHINERY CO.'s rotary furnace for forging and heat treating now incorporates a water sealed hearth construction.

ment for measuring the temperatures of very small objects, such as incandescent lamp filaments, and for laboratory work. A twenty-fold magnification of the object is provided by means of an optical arrangement of high candlepower. To obtain best results, the instrument is furnished with a rigid support and tripod, the holder having a worm gear arrangement for accurate adjustment. A precision ammeter with built-in battery is part of the equipment. The instrument operates on the principle of disappearing filament and is furnished with scale ranges of 600 to 1600 deg. C., 1600 to 3000 deg. and from 3000 to 4000 deg. C.

Reversing Cycle Timer

An improved electric timer designed to control the firing of furnaces at alternate ends, such as soaking pits and open hearths, has been developed by the *Automatic Temperature Control Co., Inc.*, Philadelphia, Pa. Principal difference between this new timer

necessary to reverse the firing, including shutting down the burners at one end, reversing dampers and starting the burners on the opposite end.

Tamper-Proof Temperature Controls

There are many instances where unauthorized or easy adjustment of thermostats for industrial unit heaters and other factory heating systems is not desirable. For this reason, the *Jefferson Electric Co.*, Bellwood, Ill., has added a concealed adjustment type of air switch control to its line. Access to the control knob and scale may be had only by removing the case, thus removing the temptation of tampering.

Low-Cost Toolroom Furnace

Baker & Co., Inc., 54 Austin Street, Newark, N. J., is making three sizes of toolroom furnaces equipped to operate on city gas without either a blower or compressed air. No. 1 size, which has a 6 x 8-in. heating chamber, 6 in. high, will maintain a constant temperature of 1400 deg. F. at a gas

perature range is 1050 to 1850 deg. F. The furnace comes in two sizes and is equipped with a Weston indicating pyrometer.

Rotary Furnace with Water Seal

A rotary furnace with water sealed hearth construction, originally designed for forging applications has received such attention that its scope has been extended to certain types of heat treating and annealing as well. Made by the *Gas Machinery Co.*, of Cleveland, this design provides a positive and easily controlled hearth seal, which in combination with tangential burner firing and a circular combustion chamber, insures close control of temperature and atmosphere throughout the heating chamber. The only opening for admission of air is the door, and inleakage here can be practically eliminated by regulation of furnace pressure.

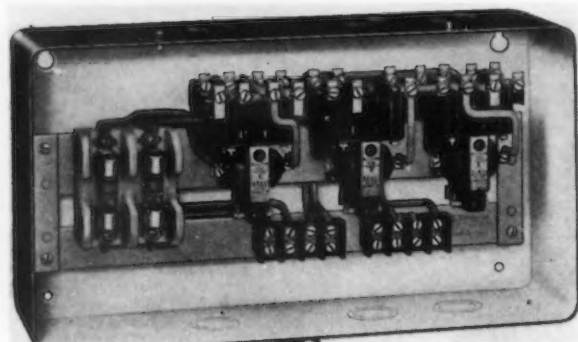
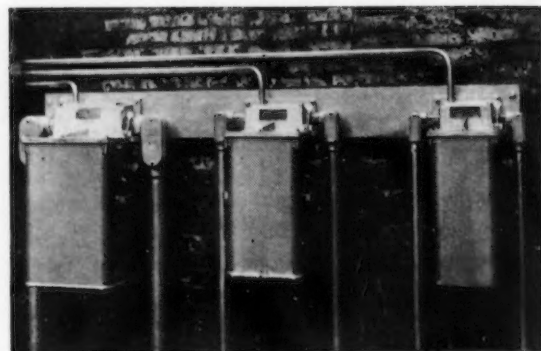
With burner adjustment for a slightly reducing atmosphere, a mini-



AT LEFT
A NUMBER of interesting features are to be found in this compact Cutler-Hammer 2-hp. across-the-line starter for squirrel-cage motors.

o o o

AT RIGHT
WESTINGHOUSE combination explosion-proof and corrosion resistant line starters have steel oil-filled tanks with cast iron covers.



AT LEFT
THE Allen-Bradley control panel is for automatically alternating duplex units, such as pumps, fans and compressors.

o o o

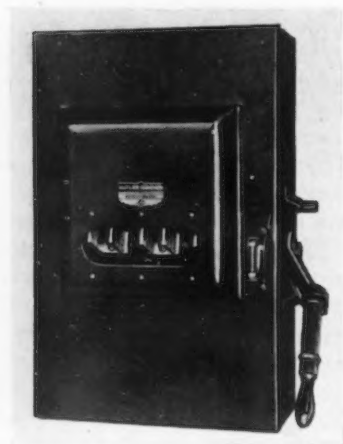
mum of scale and surface decarburization of the work can be assured. More thorough scrubbing of all parts of the charge by the heated gases is made possible, and since the charge is

in view of all radiation surfaces, a lesser amount of CO is required for minimum scaling of the work. The cold work is brought up to heat fast by heat penetration from the hearth.

Electrical Control Equipment

Starters

An extremely compact a.c. across-the-line starter for polyphase squirrel-cage motors has been recently announced by Cutler-Hammer, Inc., 258



CUTLER-HAMMER'S mill duty switches now come in a window style for quick inspection of the blades.

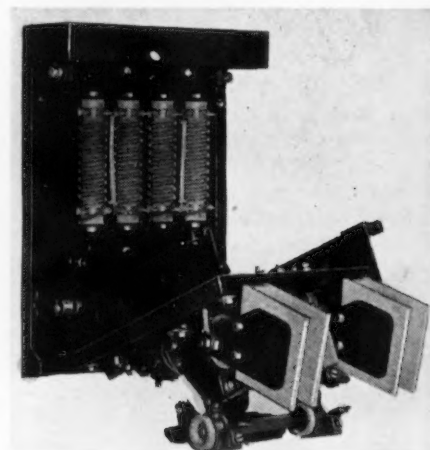
N. 12th Street, Milwaukee. This new starter, measuring only 4¾ by 8 in. and known as NEMA size 0, is rated up to 2 hp., 550 volts. Among the novel features are pushbutton operation; positive quick make and break mechanism; silver-to-silver contacts; three and four-pole construction; C-H eutectic thermal overload protection; rubber mounted operating mechanism; and an aluminum interior finish for maximum visibility. The starter is interchangeable for all horsepower sizes within its rating by changing the thermal overload coils.

Westinghouse Electric & Mfg. Co. has developed a line of totally oil immersed linestarters, known as low-voltage type DNO, for starting squirrel-cage motors in plants where either corrosive or explosive gases may be present. The combination starters provide in one oil tank complete motor control, motor disconnect switch and circuit protective devices. They have a weatherproof construction with cast iron top and heavy sheet steel tank

with gasket joint and are designed for wall or frame mounting. Overload protection is given by two thermal induction, automatic reset overload relays. Low-voltage protection is obtained with three-wire push button control.

Allen-Bradley Co., 1311 S. First Street, Milwaukee, has recently developed a pilot control panel for automatically alternating duplex units, such as pumps, fans and compressors. This panel, composed of three relays, can be used with any standard float switch and motor starter. It automatically switches the float switch control circuit from one pump starter, for example, to the other each time the unit operates. The panel can be used where two float switches are employed, so that the idle pump can be used as an automatic booster. The pilot control device may be a pressure switch, vacuum switch, thermostat, two-wire push button, or float switch.

Cutler-Hammer, Inc., 258 N. 12th Street, Milwaukee, is now making their "Current Breaker" mill duty safety switch with a window in the cover to make inspection of the blades possible from the outside. This window is 3/16-in. shatterproof glass held securely in place with a sponge rub-



RESISTORS connected across the magnet terminals reduce the kick arc in this high-speed Ohio lift magnet controller.

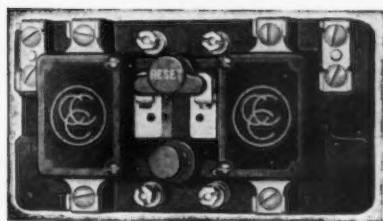
ber gasket. The switch, designated as Bulletin 4101, is basically the same as Cutler-Hammer's type A mill duty line, characterized by quick make-and-break mechanism; pressure type fuse clamps; non-current carrying hinge posts; double-break air-blanketed contacts with silver plated jaws and blades; unit pole construction and interlocking cover. The window type line is available in sizes from 30 to 1200 amp., up to 600 volts, fusible and non-fusible.

Controls for Hoists and Magnets

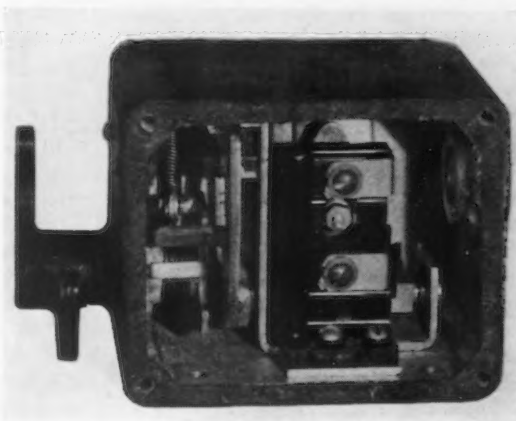
A new d.c. crane-hoist control which makes use of the rocker-bearing contactors and magnetic-time relays that have proven their stamina in steel mill service has been announced by the *General Electric Co.* Among the features of the new control are high



AT LEFT
A MOVEMENT of the plunger of only 0.001 in. will trip this Micro precision limit switch.



AT LEFT
THE Clark heavy-duty thermal overload relay provides more dependable protection for mill type a.c. motors.



THIS G-E Alnico snap-action switch is of single pole, double-action design and is oiltight.

lowering speeds, excellent speed regulation, precise spotting of the hook, protection of both motor and brake from abuse, and maximum safety for the operating crew. Regenerative braking is obtained for any load requiring 30 per cent or greater braking effort, and dynamic braking is also available for emergency stops in case of solenoid brake failure. Automatic control of deceleration by a magnetic-time relay provides safe stopping of loads when lowering.

The *Ohio Electric Mfg. Co.*, 5908 Maurice Ave., Cleveland, is offering a new MS-X controller for the operation of lifting magnets of any make that consume more than 14 amp. of current. This control provides automatically for quick drop of any kind of load without hand adjustment. It enables a magnet to drop its load of thin material in 2 sec. and the heaviest materials, like slabs, in 4 to 5 sec. When handling pig iron or assorted

scrap, it makes possible from 6 to 10 lifts per minute, according to the makers. Special resistors connected across the magnet terminals at the moment the circuit is opened reduce the kick are to a minimum.

Limit Switches

Two new developments in limit switches are being offered machinery builders for built-in use. *Micro Switch Corp.*, of Freeport, Ill., is making an interchangeable precision limit switch in which actuation is obtained by a movement of only 0.001 in. in the forepart of the total plunger travel of $\frac{1}{4}$ in. The snap plunger is sealed against the entrance of normal oil and water and its point is held in close tolerance relation to dowel holes in the mounting plate, often eliminating the necessity for adjustability of actuating parts. The switch is for appli-

cations in automatic machine tool work wherever precise limits of motion must be maintained.

Of similar purpose, but of entirely different design principle, is the new oiltight Alnico snap-action limit switch developed by *General Electric Co.* The movable contact assembly is firmly held in position by a small Alnico magnet acting on an iron yoke. When the latter is broken away by action of the operating lever, a strong spring snaps the contact assembly to the opposite position, where it is again held by the magnet. The single-pole switch has silver-faced tips on both the moving and stationary contacts to insure reliable operation and long life. Protection from oil is obtained by enclosing the switch in a steel case with two gasketed sides.

Thermal Overload Relays

A new heavy-duty mill type thermal overload relay has been developed by

Clark Controller Co. of Cleveland, to provide more dependable overload protection for a.c. motors. The normal application would be as an auxiliary device to open the pilot circuit of a magnetic starter or controller whenever the current flow is such as to cause motor overheating.

The thermal mechanism consists of selected heater units encircling a sleeve and close-fitting pin, between which is interposed a film of special eutectic metal. Any sustained overload causes the heater elements to liquefy the eutectic metal and permit the pin to turn within the sleeve, opening the relay contacts and removing the motor from the line. After a short time-delay, the relay may be reset manually and the motor restarted. A special feature of this heavy-duty relay, which has a capacity of 600 volts, is the large electrical clearances pro-

vided. The time-delay protection afforded is such as to permit high starting inrush currents without tripping.

A new thermal tripping element for motor-starting application has also been developed by the *General Electric Co.* for use with type AE-1 industrial air circuit breakers. The new unit consists of a magnetically operated tripping mechanism which is restrained from tripping on overcurrent by means of a bimetallic element having thermal characteristics suitable for the starting and running protection of a.c. motors. This bimetallic unit, heated inductively from the magnetic circuit of the overcurrent tripping device, releases the armature when the proper tripping temperature is reached. On overcurrents exceeding 10 times normal, the pull of the magnetic element acts independently of the thermal restraint, and instantaneous tripping occurs. Means of calibration of the mechanism have been provided.

. . . . THIS WEEK ON THE

... Curtailed automobile production indicated for February.

. . .

... Chrysler plants are shut down this week.

. . .

... Coke company cleared by report of Labor Board examiner.

. . .

... Norge to spend \$2,000,000 for expansion.

DETROIT.—Indicating the probable February trend, automobile production slipped off noticeably last week, dropping to 59,365 units from 65,418 the preceding week. Curtailment of operations in various Chrysler plants acted as a brake on the industry. Production in the corresponding week last year totaled 76,620 passenger cars and trucks in the United States and Canada, according to Ward's Automotive Reports.

Studebaker, which resumed two-days-a-week operation only two weeks ago, stepped up during the last week to three days a week, but with this exception there was little notable change throughout the list of manufacturers. However, as reported a week ago in *THE IRON AGE*, the American Bantam Co. at Butler, Pa., is increasing its output one-third starting Feb. 1. This plant and Ford-Lincoln and Hudson have been the only ones in the entire list on a five-day work week. Willys-Overland at Toledo, Ohio, is recalling 2000 workmen after an inventory period and will step up operations considerably.

Further Curtailment Expected

Offsetting these influences, however, will be further curtailment in assembly line operations of the major producers. Manufacturing departments have been cut in most of the larger plants to a two-day week. Ford production held firm during the last week, totaling 22,765 units, a little above the previous week. General Motors volume moved slightly down-

ward to 21,476 from 22,116. The Chrysler total was 5950 against 11,800. Chrysler plants are shut down for the first week of February and have scheduled only three days' operation for the remainder of the month. Ward's estimates February output in the vicinity of 210,000, which would be 45 per cent under last February and about 17 per cent less than the indicated January total of 255,000 units.

Buick, which has made remarkable headway against the business current, had a substantial increase in used car volume, together with a 17 per cent gain in new car deliveries during the second 10 days of January, according to W. F. Hufstader, general sales manager. Used car stocks were cut down some during this period when 8249 were sold compared with 6053 in the preceding 10 days. At the same time, domestic deliveries of new cars totaled 3033 compared with 2587 in the first January period. It is noteworthy that the ratio of used car sales to new car sales is practically constant, between 2.38 and 2.39 used cars being sold for every new car that is sold. The industry is waging one of the most important battles in its history as it attempts through cooperative advertising programs to dispose of some of the thousands of trade-ins which now stand in the way of a recovery.

Chrysler Labor Squabbles

After the executive board of the UAW had again assured General Motors that it would not permit unau-

thorized strikes, R. J. Thomas, UAW vice-president in charge of Chrysler activities, announces that the Chrysler Corp. will seek a liberalization of the "no strike" clause in its Chrysler contract. The present agreement expires March 31. A change, according to Thomas, is necessary because under the present contract "if we go with a grievance to the management and they say no, there is nothing further we can do about it. We are not opposed to a ban on unauthorized strikes, but we want some further procedure so we can arbitrate on matters in dispute."

Meanwhile, to offset unrest over rumors of layoffs, Chrysler has posted notices in various plants in an attempt to reassure the workers that no unnecessary cutting is being done. In one unit, for instance, where the men are working 6-hr. shifts two or three days a week, a widespread report that 59 men were to be laid off was denied by the management, the notice requesting the worker not to accept such rumors without verifying them. The foreman or the superintendent should be asked in case of doubt, the notice suggested.

Labor Board Rules for Semet-Solvay

A National Labor Relations Board trial examiner has recommended dismissal of charges of unfair labor practices against the Semet-Solvay Co. Opportunity has been given the union to file exceptions. If that step is taken, the intermediate report of the trial examiner will be reviewed by the entire board before a final order is given. Otherwise the examiner's findings are expected to be affirmed, marking the conclusion of several weeks of hearings which were held during last July on complaint filed by Frank H. Bowen, regional representative of the board, based on charges brought by the UAW.

The discharge of 40 employees last March 27 and 28 and alleged refusal to bargain collectively were the principal charges. The examiner, William R. Ringer, found the evidence insufficient to support a holding that the company had interfered with the rights of self-organization. Regarding discharge of the 40 employees, he found that it was due to a curtailment of working forces and a change of

ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

production from domestic to foundry coke and that in several instances the men had been rehired when operations again were expanded. The first discharges were made prior to the existence of a union, he found. The examiner ruled that the union never had obtained a membership equal to 50 per cent of the workers. His ruling implies recognition of the fact that management may express its opinions about union organization without transgressing the Labor Act.

"Although there is evidence," the report says, "that at various times certain of respondent's officers and foremen warned employees against the serious results of a sitdown strike in the plant and thereby to some extent implied disapproval of the union, yet such testimony is not sufficient, in the opinion of the undersigned, to authorize a finding of interference with the right of employees to self-organization." The report held that the evidence did not support the charge that the company had fostered or dominated in the formation of the "Coke Oven Employees Association," a rival union which was represented as an intervenor in the hearing.

Further court tests are scheduled

for the Dearborn ordinance which has hampered the UAW in distributing literature at the Ford plant. Hearing of the first case is scheduled for Feb. 15. If the court finds that a unionist was guilty of a violation of the traffic ordinance when he passed out a UAW paper on Miller Road near the Rouge plant, charges will be pressed against the 1000 others who had been booked for similar violations. One case against a UAW member was dismissed because of a technicality. It was alleged that one of the union group maliciously destroyed property by throwing a stone through the window of an automobile. Because more than 10 days elapsed before the arraignment and trial, a justice court dismissed the case. A new charge of disorderly conduct and assault was planned by the corporation counsel's office.

Norge to Spent \$2,000,000

Officials of the Norge division of Borg-Warner Corp. have just announced a \$2,000,000 expansion program. Howard E. Blood, president, said that \$1,200,000 will be used to enlarge the Detroit plant and \$800,-

000 would be spent on the Muskegon, Mich., plant. Most of the Norge work currently being done is at Muskegon, where 3100 employees returned to their jobs this week, bringing the total employed to 3500.

Detroit Edison Co. plans for expansion in 1938 are not an unqualified gamble on a quick end to the current recession, according to a statement of Alex Dow, Detroit Edison president. The \$18,000,000 construction budget announced last week is subject to revision if that becomes necessary, he explained.

"We are neither optimistic nor pessimistic, but are always willing to buy a year or two ahead of our needs if the markets for materials are good and we can see the money. By so doing in 1934 and 1935 we avoided the overtime costs, the night work and the extra expenses that would have fallen on us if we had delayed until 1936 and 1937."

Alfred P. Sloan, in a statement issued recently to General Motors Corp. 375,000 stockholders, said that good wages and a high standard of living can prevail only "to the extent that we are able to promote and capitalize

EXPANDING business in foreign countries is one of the brightest spots in the automobile picture. Export of cars increased during the last year and led Willys-Overland to announce plans recently for foreign assembly plants in Europe, South America and Africa. The shipment shown here being loaded on the S. S. Goolistan in New York harbor, included also 200 unboxed automobiles which were loaded on the same vessel. All were destined for delivery to South African customers.



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technological progress." The automobile industry, Mr. Sloan said, contributed to the goal of a higher standard of living by boosting hourly wages 18 per cent in the period from 1925 to 1937, while car prices per pound were reduced 45 per cent. Mr. Sloan contended "too much thought is given to what a worker may earn either on an hourly or weekly or even on an annual basis in terms of money. We forget that money is purely a medium of exchanging labor in one form for labor in another form. What a worker can get for his labor depends upon the prices which he has to pay for the labor of others."

Payrolls Decline Sharply

A sharp decline in weekly earnings and real earnings in the automotive industries of Michigan is revealed by the latest report of the State Department of Labor and Industry. The weekly earning index declined from 92.8 per cent in November to 85.5 per cent in December and the real earnings index declined similarly from 115.1 to 111.5. A year ago in December the earnings index was 96.4 and the real earnings index was 117.7. The index of living costs in Michigan industrial centers has followed about the same course. In December, 1936, it was 81.9, in November, 1937, it was 80.6 and in December, 1937, it was 76.7. Payrolls in the automotive industries have shown a decline of 27.6 per cent between November and December and are undoubtedly much

lower for January. The number of employees decreased 13.1 per cent between November and December; the layoffs at General Motors, Chrysler and Ford during January undoubtedly indicate a further decrease in the total number of employees.

Before a University of Michigan economics class, Richard T. Frankenstein of the UAW admitted last Friday that some labor leaders are blocking the CIO-AFL merger because of fear of "losing their jobs." The rank and file of workers eventually will force an alliance, Frankenstein said. "The merger is doubtless a long way off, but it is inevitable. The employer, the worker and the public all suffer from a split union," he declared.

The UAW leader was the second to appear in a scheduled lecture series before the students of labor problems. The employers' view had been presented on a previous occasion by a representative of the Detroit Edison Co.

Auburn, Pierce-Arrow Plan To Reorganize

DETROIT.—Auburn Automobile Co., Connersville, Ind., and its subsidiary, the Lycoming Mfg. Co., have filed petitions for reorganization under Section 77B of the Federal Bankruptcy Law. The move is generally regarded as indicating the intention of the management to produce automotive parts, rather than to

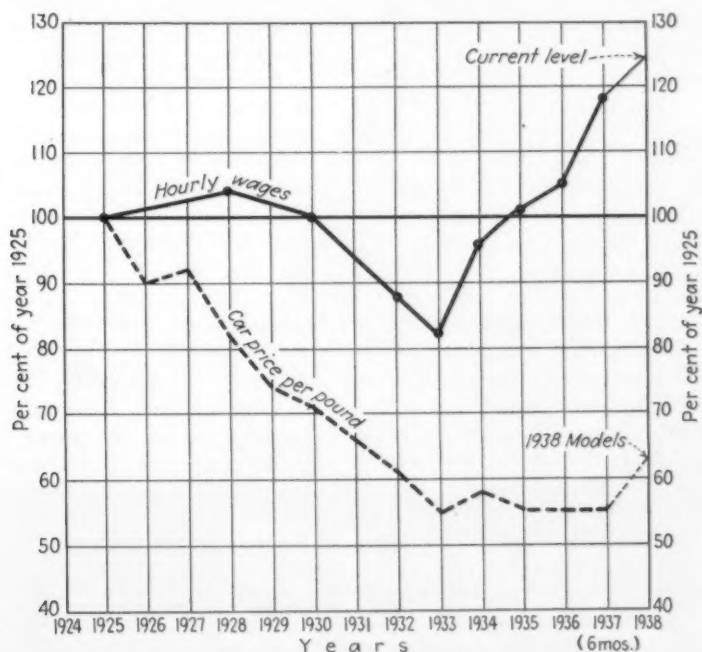
manufacture automobiles, a phase of the Auburn-Cord activities which was discontinued several months ago.

Hearing on a similar petition for the Pierce-Arrow Motor Car Co., of Buffalo, has been set for Jan. 17. This company is reported to be planning the production of a light car, in contrast to the high-priced automobiles which it has made.

Indianapolis Machinery Adds Two Departments

DETROIT.—Addition of two new departments and greater plant facilities is announced by the Indianapolis Machinery & Supply Co., Inc., a jobber of steel, mill, mine, factory and electrical supplies and machine tools. A building addition gives the company a total floor space of 130,000 sq. ft. for warehouse space, loading facilities and office space.

A new power transmission department will be headed by H. F. (Pat) Gallagher, a graduate of the Massachusetts Institute of Technology and an industrial engineer. This department also will handle pumps, air compressors, unit heaters and fans and blowers for air conditioning work. A new electrical department will be headed by Charles Boling, an engineer, and will specialize in the installation, repair and sale of electric motors and generators, starting equipment, Electric hoists and related items.



AUTOMOTIVE hourly wages have advanced 18 per cent while prices of cars (per pound) have dropped 45 per cent since 1925, according to a statement issued by Alfred P. Sloan.

100 Sign For Detroit Machine Tool Show

DETROIT.—Additional space for the Detroit Machine and Tool Progress Exhibition to be held here March 9-12, has been thrown open by the American Society of Tool Engineers as a result of an almost complete sell-out of the original exhibition space in Convention Hall.

More than 100 exhibitors have already been definitely assigned, according to Ford R. Lamb, executive secretary of the society. "In order to save time, we will not send out floor plans of the additional space," he said. "Rather we will assign the best space available in the new section to exhibitors in order of receipt of applications." The layout includes booths measuring 10 x 10 ft., 20 x 20 ft. and 20 ft. wide by 15 ft. deep. The additional space is located adjacent to original sections.

THIS WEEK IN WASHINGTON

... Many blame Labor Board for business recession, Nebraskan tells Senate judiciary committee in demand for investigation of its functioning.

o o o

... President's remark he "doesn't know" whether steel prices can be cut without wage cut ignored in confusion over his attack on quotations.

o o o

... Observer finds Washington business conferences mean little unless Administration ends its shifting with changing political winds.

By L. W. MOFFETT

Resident Washington Editor
The Iron Age

o o o

WASHINGTON. — A Senate Judiciary sub-committee last week heard Senator Burke, Democrat, of Nebraska, level a bitter attack against the National Labor Relations Board, charging the record in the Weirton Steel Co. trial showed the board's major interest in the case was to "discredit the company rather than to hold a fair and impartial hearing."

Burke, who became a hostile Administration critic when the New Deal's Court packing plan was launched, appeared before the committee to urge favorable action be taken on his resolution to investigate the NLRB. Reminding committee members there is "widespread distrust of the board and the way it is functioning," the Nebraskan pointed to the barrage of criticism directed at the agency and declared that many believe the blame for the current economic recession in business can be laid on the Labor Board's doorstep.

"Many prudent and patriotic business men are coming to feel that they cannot long continue to operate if they must remain subject to what they consider to be the outrageous treatment inflicted upon them by this board and

its horde of examiners, investigators and other representatives," the Senator said.

Board Hears Attacks

Occupying front row seats at the hearing, held in the large Senate Caucus room, were the members of the Labor Board and a retinue which included its general counsel and public relations adviser. Senator Robert F. Wagner, Democrat, of New York, co-author of the labor law which bears his name, sat near the committee table, although he is not a member. He whispered occasionally to Senator Hatch, Democrat, of New Mexico, and conferred briefly with J. Warren Madden, board chairman, before rushing away from the hearing.

Whether the Senate Judiciary Committee was the proper committee to investigate the Labor Board consumed most of the time at the first-day session. Burke, who was interrupted frequently while reading his prepared statement, took the position that the Judiciary Committee was the proper investigator since the board is a judicial body despite the widespread belief it is not functioning "in a judicial manner." In substantiation he cited Chairman Madden's description of NLRB's function as "quasi-judicial" and added that the Board's army of examiners are "holding court" in every industrial center in the country.

Other committee members including Senators Hatch, Dieterich, Democrat,

of Illinois, and Norris, Independent Republican, of Nebraska, disagreed. Senator Neeley, Democrat, of West Virginia, sub-committee chairman, who numbers thousands of John L. Lewis' United Mine Workers among his constituents, remained non-committal.

Other sub-committee members include Logan, of Kentucky, Connally, of Texas, both Democrats, and Austin, Republican, of Vermont. Connally was the only member of the sub-committee not attending the hearing.

Committee Reported Divided

The sub-committee is reported to be closely divided on the question of authorizing a Labor Board inquiry with Connally, Austin and Logan expected to line up with Burke, also a sub-committee member. In his prepared statement, Burke relied heavily on the support of William Green, AFL chieftain, who said later in the day that a NLRB investigation at this time was "inadvisable."

Senator Burke, however, was represented as feeling that his colleagues might vote for a Senate inquiry after weighing the seriousness of his charges.

"It (the board) has produced more strife, more unrest, more uncertainty, and more misunderstanding in the relationship between employee and employer than we have ever had before," the Senator declared. "It has shackled men and prevented them from expressing their wishes. It has put up a barrier between well-intentioned workmen and right-thinking employers, a barrier so high that it seems impossible to surmount it."

After citing numerous charges brought against the board from time to time ranging all the way from alleged CIO bias in the Consolidated Edison decision to reputed attacks on freedom of the press in the *Mill and Factory* case, the Senator repeatedly referred to the NLRB-Weirton Steel case and said he was prepared to call witnesses who would testify that the proceeding throughout has been "a bald-faced attempt to dismember a local or unaffiliated union and set up

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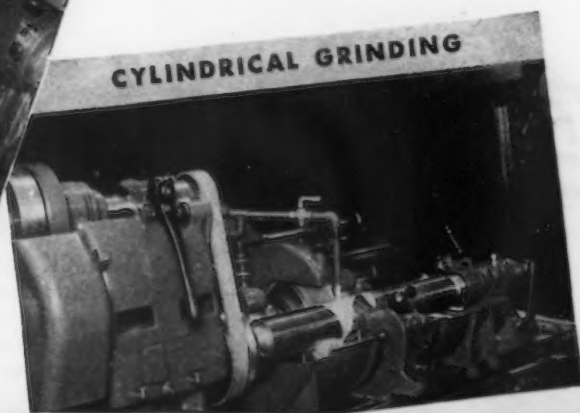
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in its place a branch of the CIO." In the Weirton case he said the record indicates that the examiner has only one purpose and that is "to get the Weirton Steel Co."

Steel Cases Objectionable

He said actions of the board's attorney's have been "particularly objectionable" in cases involving the Republic Steel Corp., the Weirton Steel Co., the Electric Boat Co. and others. In connection with his charges that the NLRB had violated the funda-

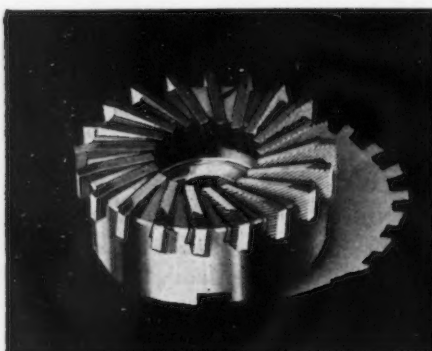
mental right of freedom of the press, Burke submitted for the record copies of the illusive subpoena which the board had served on Hartley W. Barclay, editor of *Mill and Factory*, in an attempt to secure all data on "The True Story of Weirton," which was severely critical of board activities.

Replete with an abundance of "and/ors" and "whereas's," the summons even asked for "all drafts, outlines, sketches, and lay-outs prepared in connection with, or in contemplation of, the article . . ." The board

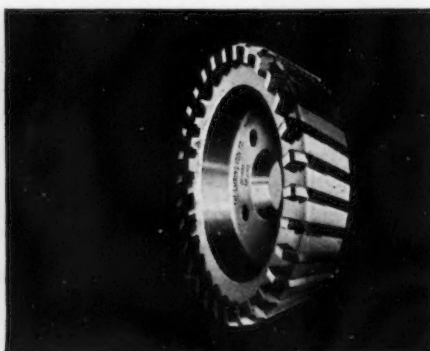
had used every precaution in withholding the subpoena from public scrutiny.

The NLRB resolution proposed by Burke would authorize an expenditure of \$25,000 to investigate charges of favoritism for one type of union, intimidation of employers and public officials, violation of freedom of speech and of the press, engendering disrespect for law and order, increasing dissension in industrial relations, and defeating the purposes of the Wagner Act.

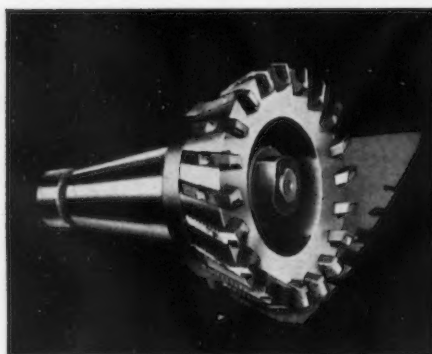
The preliminary inquiry assumed the proportions of a major investigation when the sub-committee announced that Labor Board members would be asked to appear, and Burke indicated his intention of cross-examining the witnesses.



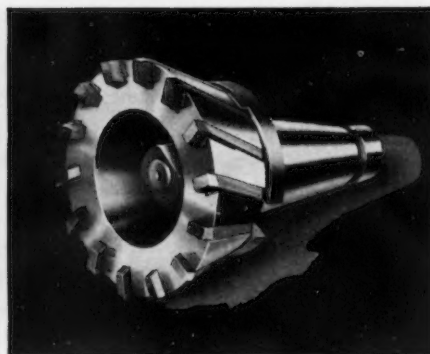
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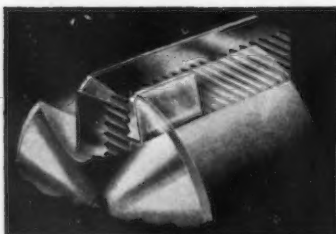
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Peiping Cuts Duties On Steel Products

WASHINGTON. — The local Provincial Government of Peiping has announced reductions, effective Jan. 21, in the Chinese customs duties on imports from all countries on a substantial list of products imported into the northern Chinese territory now under control of the Provisional Government, according to a radiogram received in the Department of Commerce from the American Embassy at Peiping. At the same time export duties were temporarily removed from a group of products, including ores, and iron and iron manufactures.

The Provisional Government authorities stated that the reduced import duties were intended for the purposes of rehabilitating the distressed area and relieving the burden of the people; and the removal of the export duties was intended to aid local agriculture and industry. Mining machinery, blast furnace machinery, refining machinery, and agricultural machinery were exempted from import duty.

Navy Buys 4,000,000 Lb. Of Chrome Ore In West

WASHINGTON. — The Navy Department last Friday awarded a contract to the United States Chrome Mines, Inc., San Francisco, for 4,000,000 lb. of chrome ore for stocking at the Philadelphia Navy Yard at 3.14c. per lb. of contained chromium, delivered. The ore is to come from California and Oregon deposits.

Roosevelt Expressed Doubt On Steel Price-Wage Reductions

WASHINGTON. — "Do you agree with Mr. Fairless that steel prices can't be reduced without cutting wages?"

This question, which does not fully reflect what the president of the United States Steel Corp. said, recently brought from President Roosevelt the reply that he did not know whether steel prices could be reduced without cutting wages. This significant answer was disregarded, little publicized or almost entirely submerged by the daily press, which gave prominent space to the President's prepared statement strongly opposing wage cuts as a means of reducing prices.

The prepared statement caused reverberations in the stock and commodity markets and in particular intensified the growing feeling of uneasiness in the mass industries generally because of the President's resumed attack on their price structure.

The President's acknowledged uncertainty whether steel prices could be cut without reducing wages was disclosed when he was asked specific questions on the basis of the prepared statement. The statement which awaited the correspondents as they entered the President's office was couched in broad terms and dealt with the mass industries generally in so far as it strongly inferred they should maintain wages and reduce prices.

Thinking of Steel

It did not single out any individual industry on this point. No doubt it purposely avoided doing so. Nevertheless the question itself definitely mentioned steel prices and wages, and for that reason the natural impression gathered from the prepared statement was that the President had the steel industry especially in mind in suggesting a wage-maintenance-price-reduction policy.

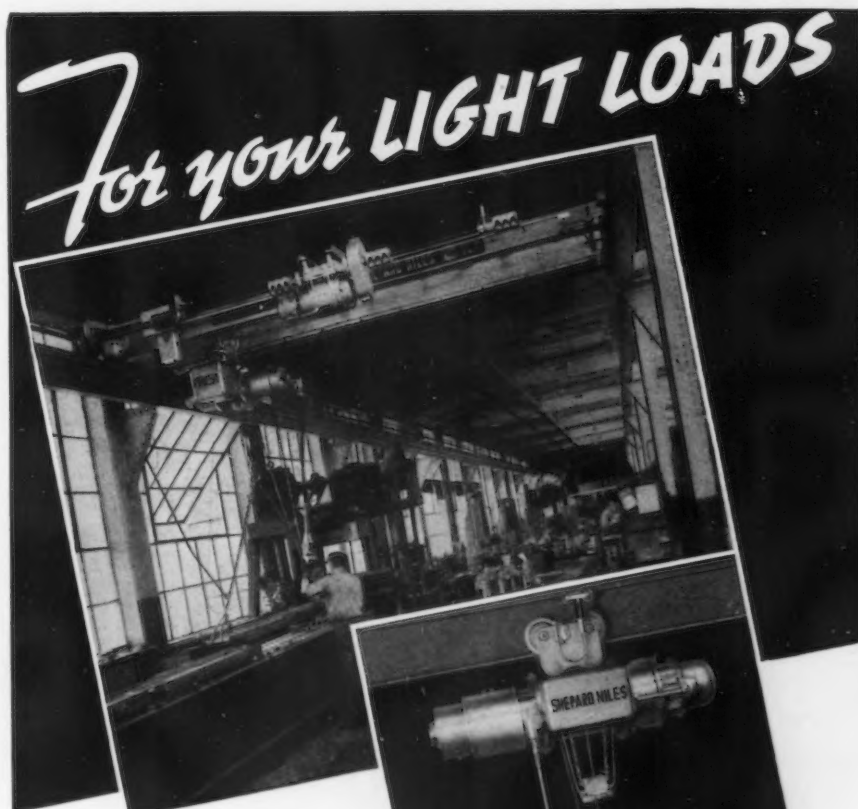
The impression perhaps was reinforced by reason of the Washington view that the steel price structure is the key to the entire durable goods price structure and that any change made in the former will affect the latter. Moreover, the view that the steel industry was particularly singled out quite conceivably was heightened by reason of the President's direct reference to the industry wherein he said, "The steel industry cannot make a

profit at 30 per cent capacity, but it can at 50 or 55 per cent of capacity," itself a loose statement that will not bear scrutiny. It is open to the criticism that it disregards both prices and the lines of production. In the industry itself it is maintained that it cannot net reasonable profits at prevail-

ing prices until it attains an operating rate of 70 per cent of ingot capacity.

President Weakened Argument

In any event the President conceded that he did not know whether the steel industry could cut prices without reducing wages. Thus he weakened the entire argument that he set up in his prepared statement. It denoted that without using necessary information he had engaged in discussion of a broad subject of a peculiarly sensitive



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nature at this time of sagging markets and pending wage settlements.

Most certainly the steel industry insists that price reduction cannot be made without also reducing wages. Mr. Fairless, however, stated the case more broadly. In a prepared statement he told the Senate Committee on Unemployment and Relief that steel prices cannot be reduced without a corresponding reduction in costs of which wages is the most important part. This observation is accepted as a matter of course by the steel industry generally. It has been pointed out that while the increase in costs is due chiefly to wage increases they have been affected by increased prices of raw materials. Supporting the position of the industry against price re-

ductions is the strong stand of the CIO.

John L. Lewis has said that it would be "economic suicide" for the steel industry and, for that matter, other mass industries to slash prices. He has pointed out that the steel industry is already in the red at present prices and its existing low rate of operations. Philip Murray, SWOC head, also has come out strongly against steel price cuts. They realize that price reductions will mean wage reductions and they have declared wage reductions will not be accepted, though it remains to be seen whether developments may compel a retreat from that position. Their position is said to have been stated directly to the President when they recently were

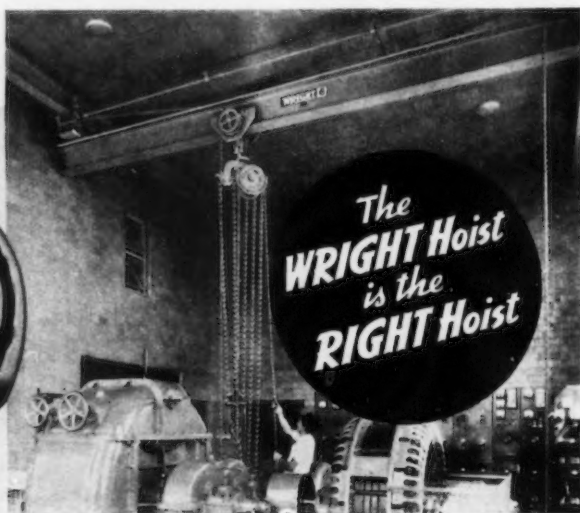
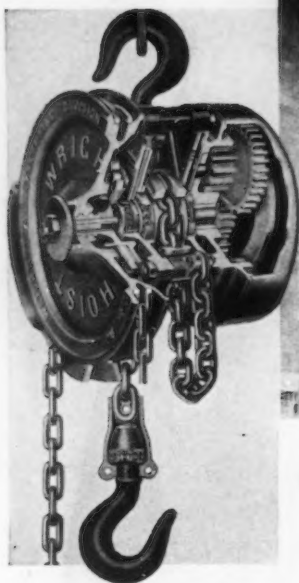
members of a delegation which participated in a White House-Government-business-labor conference. It has been restated subsequently and probably is intended to serve as advance notice of the SWOC attitude in wage negotiations which it will begin with United States Steel Corp. subsidiaries next Monday.

Another Spending Orgy?

It is also suspected that the President's statement was inspired in support of organized labor's opposition to wage reductions and possibly had steel wage negotiations immediately in mind. Whether this is so or not, the President has gone in an opposite direction from that of organized labor in suggesting price cuts. The industries to which the suggestion has been made insist that he is asking for the impossible and that it cannot be made effective despite the warning that if they reduce wages "they will make it necessary for their Government to consider other means of creating purchasing power." Even if this warning means, as is commonly thought, that the Administration will indulge in another wild spending orgy and an accompanying dangerous inflationary movement, it is contended wage maintenance depends on price maintenance also. As a matter of blunt fact many think the Administration already has made up its mind to another "pump priming" spree and that it will be urged on by Congress regardless of what industry does about prices. Spending power means political power. A congressional campaign is near at hand.

Confidence Is Needed Most

Agreement with the President is widely accorded that it is wholly desirable to maintain wages, build up purchasing power and increase employment. But it is explained that purchasing power cannot be increased until confidence is restored. Restoration of confidence is held to be a Government problem whose solution lies in calling a halt on business baiting, in reducing taxes, in breaking up the greatest monopoly in the country—monopoly of Government, with its ever-growing political bureaucracy. Confidence is frustrated when business is fed on pious talk of Government-business cooperation while at the same time business is subjected to muck raking and its advice ignored. The "advice," such as it is with its pontifical tone, all comes from the Government which seems to believe



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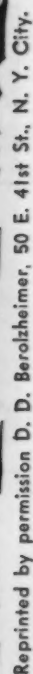


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only in one-way cooperation. Having in mind—and what taxpayer doesn't have it in mind?—the New Deal's unprecedented spending, debt and deficit one can sense the exquisite irony of the Presidential preachment to business on "financial bankruptcy" "moral bankruptcy" and "bankruptcy of sound business judgment."

To indicate that price reductions will increase volume production, which is particularly essential to mass industries, is the reverse of experience. Declining prices mean declin-

ing markets because prospective buyers withhold purchases awaiting and expecting still lower prices.

Sustained buying in volume is built upon a stable and reasonable price structure and, until the Administration affords the necessary confidence that will not come about, its conferences with labor and business "big and little" will mean nothing. Lower prices and maintenance of wages are compatible only with confidence from which springs spreading markets, more efficient production and reduced

costs, provided labor itself cooperates so as to justify confidence.

Administration Should "Stay Put"

Confidence will never be achieved while there are constant shifts in the Washington attitude, one that veers with political winds. It is time for "stabilization" in officialdom as well as in the markets. It should stay more put, changing only when recognized facts and conditions warrant changes.

It had been thought with what appeared to be adequate reason that the Administration had decided to end its jittery provoking campaign against steel prices. It asked for and was given Government studies on steel prices by two Government branches. Both justified prevailing prices. If the information, which is said to have been carefully and fully presented, was not wanted, why was it asked? Was it the hope that the information would justify the distorted stuff that had been broadcast to the nation by Jackson, Ickes and Henderson, et al.? But since the hope was not realized was it decided to disregard the facts and build up political ballyhoo couched in terms of unctuous generalities? Or was the talk a "trading" argument, or an effort to get lower prices on national defense needs? Or, is it just another chat of only passing importance?

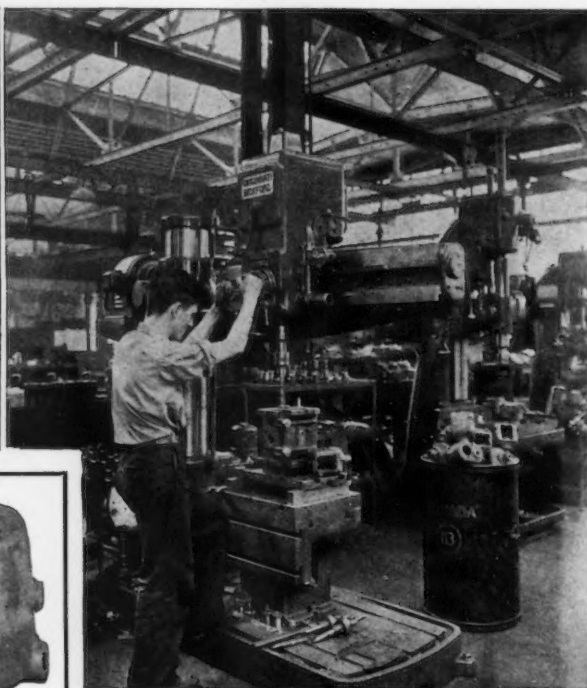
The White House statement, as was inevitable, was seized upon at the Capitol to make political hokum. An outstanding steel expert, a zealous devotee of "the peepul," proposed an investigation to determine whether present steel prices are justified.

"Let them cut material and other costs, and not try to take it out of labor," glibly said Senator Minton, Democrat of Indiana. The Senator didn't spare any of his precious time to say what he thinks makes up the major portion of "material and other costs." Probably he doesn't know, if that is conceivable. He might go into a huddle with Mr. Lewis and be informed.

N.L.R.B. Calls Election In Shipbuilding Yards

WASHINGTON.—The National Labor Relations Board has called an election at the shipbuilding yards of Ira S. Bushey & Sons, Inc., of New York, to permit workers to vote either for or against the CIO's marine and shipbuilding workers union.

HIGH SPEED "All Geared" SUPER-SERVICE RADIAL DRILLS



THE JOB

Drill and Tap $\frac{1}{2}$ " hole
Drill and Tap $\frac{35}{64}$ " hole
and thread with $\frac{35}{64}$
by 18 thread
Drill and Ream $2\frac{3}{8}$ " holes
Drill and Spot Face $1\frac{7}{8}$ "
hole
Drill and Spot Face $1\frac{3}{4}$ "
hole
Drill and Tap $2\frac{1}{4}$ " x 20
thread holes
Drill and Tap $2\frac{3}{4}$ " holes
Drill $2\frac{1}{4}$ " oil holes
(Depth of holes drilled
varies)

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spot faces, and reams
to limits of $\pm .0005$ "

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The

CINCINNATI BICKFORD TOOL CO., Oakley, Cincinnati, Ohio

New U. S.-to-Britain Tariff List Is Filed

WASHINGTON.—In the State Department's supplemental list of products on which this country will consider granting tariff concessions in the pending reciprocal trade negotiations with the United Kingdom are machine tools and parts, hollow bars and hollow drill steel; internal combustion motor-boat engines and parts; and builders' hardware.

Objections to the supplemental list should be filed with the Committee for Reciprocity Information before Feb. 26. Oral arguments will be heard at public hearings starting March 14.

December Farm Tool Exports Rise Sharply

WASHINGTON.—Exports of farm equipment from the United States during December totaled \$6,694,612, a 63 per cent increase over the corresponding 1936 shipments valued at \$4,094,787, according to the Machinery Division, Bureau of Foreign and Domestic Commerce, Department of Commerce. Exports for the year 1937 totaled \$75,366,103, an increase of 71 per cent over the 1936 shipment valued at \$43,993,215. The 1937 foreign sales represent the largest annual volume recorded since 1930 when this trade aggregated \$115,819,479.

South African Chrome Ore Offerings Climb

WASHINGTON.—South African chrome ore is being offered in world markets at the rate of 1500 tons per month, the Department of Commerce reports. Producers are opening other properties expected to be in operation by February. Interested American firms can communicate with the Bureau of Foreign and Domestic Commerce at Washington or with the bureau's branch offices.

Navy Buys 56 Plane Motors From Wright Aeronautical

WASHINGTON.—The Navy Department has awarded a contract for \$1,008,217 to the Wright Aeronautical Corp., of Paterson, N. J., for 56 airplane motors and parts. The new motors will be used for the 21 two-motored flying boats now being built at the Glenn L. Martin Co. plant in Baltimore.

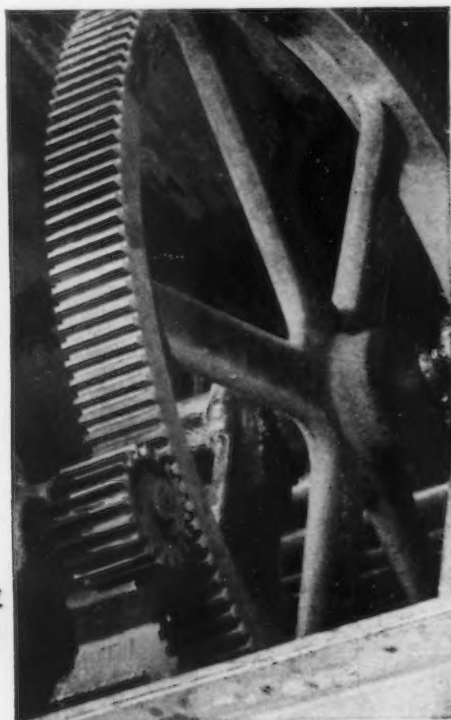
Zinc Exports Show Gain In December

WASHINGTON.—Exports of zinc were valued at \$155,339 in December against \$135,994 in November and \$114,954 for December, 1936, according to preliminary figures released by the Metals and Minerals Division, Bureau of Foreign and Domestic Commerce. Zinc in sheets, strips, or other similar forms amounting to \$86,102 worth, was the principal class of this material exported.

Imports dropped to \$174,863 in December from the \$214,538 in November last. Receipts in December, 1936, were valued at only \$91,656. Zinc in blocks, pigs, or slabs—\$167,116 worth—was the leading item of import.

Youngstown Sheet & Tube Co., Youngstown, showed a profit for year 1937, after all charges, including depreciation and depletion, of \$12,190,649 as compared to net profit of \$10,564,501 for the year 1936, according to the preliminary report of the company's consolidated income account made public Jan. 28. Net earnings for the fourth quarter of 1937 were \$1,696,022, after usual year-end adjustments.

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New York Office: 75 West Street, Phone Whitehall 4-4487

Ten More Cargo Ships To Be Built In Next Five Years

WASHINGTON.—The Maritime Commission announced last week that the American Export Lines, of New York City, operator of one of the largest fleets in the American merchant marine, had signed long-

term operating subsidy contracts with the commission, agreeing to build 10 steel cargo ships in the next five years at an estimated cost of \$20,000,000.

Construction of four of the vessels will start this year, the commission said. Officials estimated the ships will require about 3500 tons of steel each. This brings the number of ships on the commission's projected construction program to 87. Total cost of the program has tentatively been estimated at \$200,000,000.

NLRB Certifies AFL Union For Perry-Fay Workmen

WASHINGTON.—The National Labor Relations Board has certified the AFL's International Association of Machinists union as the exclusive collective bargaining group for workers at the Perry-Fay Mfg. Co.'s plant at Elyria, Ohio. The board said it based its action on the results of a secret ballot election held Jan. 13. No other union was involved, voters casting ballots either for or against the AFL union.

Gate Hoist Contract Goes to Foote Brothers

WASHINGTON.—A \$44,637 contract for spillway gate hoists for Seminole Dam has been awarded by the Bureau of Reclamation to the Foote Brothers Gear & Machine Corp., of Chicago. The bid was the lowest of 10 received by the Bureau.

SWOC Pays \$2284 Fines For Organizers

CLEVELAND.—In full payment of fines and costs assessed against Gus Hall, SWOC regional director, who pleaded guilty recently to a malicious destruction of property charge in connection with the Republic Steel Corp. strike, and seven other persons, a check for \$2284.19 was forwarded from SWOC headquarters at Pittsburgh last week to the Warren, Ohio, clerk of courts.

Metals Body, Foundrymen To Hold Joint Gathering

CLEVELAND.—A joint dinner meeting of the Cleveland chapters, American Society for Metals and American Foundrymen's Association, will be held Monday, Feb. 7, at the Cleveland Club, with A. L. Boegehold, General Motors Corp., Detroit, scheduled to speak on "Modern Cast Iron."

Koppers Acquires Rights To Michigan Valve Line

KOPPERS CO., Pittsburgh, has acquired exclusive rights to manufacture and sell the line of valves and other waterworks and sewage equipment formerly produced by the Michigan Valve & Foundry Division of the Timken-Detroit Axle Co.

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has
set up
its
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- REAR EXTENSION GUIDED SLIDE has the advantages of great guided length and perfect die match at the same time affords full accessibility to the pitman.
- ROLLED STEEL PITMAN, flame-cut from special analysis rolled billet with wrist pin augmented by thrust shoe bearing for outside pitman end.
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...OBITUARY...

FREDERICK L. ALLDIS, superintendent of the sheet metal division of Chrysler's Highland Park Plant No. 3, noted throughout the automotive industry for his knowledge of stamping practice and for the development work he had done in nearly three decades in the industry, died Jan. 27, of pneumonia, following an appendicitis operation. Mr. Alldis was born Dec. 1, 1878 in London, Ont., and went to Detroit when he was 20 years old to work at the Detroit Steel Casting Co., which later became the Detroit Stove Works. During a strike in 1907 he

for only one night to think the matter over—other experts had been considering the problem for months. He solved many other similar problems in the days when automotive stamping practice was undergoing great changes. One of his most recent feats occurred in the last year, when an emergency in a supplier's plant made it necessary for Chrysler to manufacture and assemble frames for its cars. Starting with a crowded storage space, he cleared out part of the building and

began the installation of stamping and welding equipment immediately. In less than two weeks a new frame plant was in operation. It is said by his associates that in times of stress or important plant changes, he frequently arose from his bed at two o'clock in the morning, after only a few hours' sleep, to go to the plant.

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became connected with the Briscoe Co. Starting as a laborer, he became assistant foreman within three months, superintendent of the plant within three years and factory manager a year later. Through a series of corporation changes, the Maxwell-Briscoe concern, which developed the Maxwell car, was absorbed by the U. S. Motor Co. and later became a basic part of the Chrysler Corp. Mr. Alldis stayed with these predecessors and with Chrysler continuously during this time and became noted particularly for his solution of such important problems as the manufacture of crown fenders. Approached by one of the motor manufacturers for an opinion on the feasibility of making crown fenders, he surprised them by asking

for the Vanadium Corp. of America, New York, died of pneumonia at his home in Yonkers, N. Y., on Jan. 19, aged 60 years. After attending the University of Wisconsin, he entered the service of the Minnesota Iron Mining Co. in 1900, and later was employed by the Oliver Mining Co.

In 1925 he became associated with the Vanadium Corp. of America as consulting engineer, becoming vice-president in 1929.

HERBERT W. TINKER, widely known Milwaukee mechanical engineer, died on Jan. 23, aged 54 years. He had been ill six months. Mr. Tinker for 20 years was chief engineer of the Federal Pressed Steel Co., Milwaukee, and when this interest dissolved, was for several months general manager of the Warner Electric Brake Co., Beloit, Wis. In 1936 he became mechanical engineer of the Seaman Body Corp., Milwaukee, subsidiary of the Nash-Kelvinator Corp., Kenosha, Wis., and Detroit.



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U. S. Steel Salaried Men Cut Half Day

ALL executives and salaried employees of the United States Steel Corp. and subsidiaries began "sharing the work" on Feb. 1. Work time has been reduced from a five and a half day week to a five day week with the corresponding cut in salary. Reduction in pay will amount to 9 1/11 per cent.

Approximately 23,000 salaried employees are affected in this rotation time off plan. As many employees as possible will be given Saturday morning off but a skeleton force will remain at work during that time to take care of necessary business.

As there is no change in the basic salary rate, a decided improvement in the steel business will restore the half day now being taken off.

Wage earners in the mills have been "sharing the work" for some time owing to the precipitous drop in steel business. Basic wage rates remain unchanged and will be up for negotiations next week when the Steel Workers Organizing Committee representatives meet with United States Steel Corp. officials. Present SWOC contracts expire Feb. 28, but some announcement on new contract relations is expected before that time.

Executives and salaried employees of Jones & Laughlin Steel Corp. will take one-sixth time off without pay, equal to 16 2/3 per cent reduction.

Metal Wear Discussed In New Booklet

THE engineering experiment station of Ohio State University has announced the publication of Bulletin 97, "Wearing Properties of Some Metals in Clay Plant Operation," by Arthur H. Dierker and J. O. Everhart. This report on 39 materials, including various compositions of cast iron, steel, and malleable iron, gives the comparative wear in pugmill knives, muller tires, die liners, and screen plates, all of which are important parts of heavy clay working machinery.

The data contained in this report will aid clay product manufacturers in selecting material for various machine parts. The bulletin, illustrated with photomicrographs, costs 30c. postpaid.

COMING CONVENTIONS

Feb. 3 to 4—Milwaukee Chapter, American Foundrymen's Association, regional conference, Hotel Schroeder, Milwaukee. D. M. Avey, 222 West Adams Street, Chicago, is secretary-treasurer of the association.

Feb. 8 — Directors' meeting, Foundry Equipment Manufacturers Association, Cleveland Hotel, Cleveland. Arthur J. Tuscany, Penton Building, Cleveland, is executive secretary of the association.

Feb. 10 to 12—Annual conference of the iron, steel and allied industries, Del Monte, Cal. E. H. McGinnis, 920 Wilshire Boulevard, Los Angeles, is chairman of the conference committee.

Feb. 14 to 17—A.I.M.E. annual meeting, Waldorf-Astoria Hotel, New York. Details may be secured from John T. Breunich, 29 West 39th Street, New York.

Feb. 15 to 17—American Management Association, Palmer House, Chicago. James O. Rice, 330 West 42nd Street, New York, is in charge of the meeting.

March 9—Regional meeting, American Society for Testing Materials, Seneca Hotel, Rochester, N. Y. The society's secretary is C. L. Warwick, 260 South Broad Street, Philadelphia.

March 10 to 11—Aeronautic meeting, Society of Automotive Engineers, Mayflower Hotel, Washington. John A. C. Warner, 29 West 39th Street, New York, is secretary.

March 21 to 25—Western Metal Exposition and Congress, Pan-Pacific Auditorium, Los Angeles, sponsored by the American Society for Metals and 17 other technical societies. Information may be secured from W. H. Eisenman, secretary, A.S.M., 7016 Euclid Avenue, Cleveland.

May 3 to 4—American Steel Warehouse Association, Inc., Waldorf-Astoria Hotel, New York. W. S. Doxsey, 422 Terminal Tower, Cleveland, is secretary of the association.

May 14 to 19—American Foundrymen's Association, annual convention, Cleveland. Secretary of the association is D. M. Avey, 222 W. Adams Street, Chicago.

June 27 to July 21—Annual meeting, American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J. C. L. Warwick, 260 South Broad Street, Philadelphia, is secretary of the society.

TRADE NOTES

Alfred Heller Heat Treating Co. announces opening of a new plant at 391 Pearl Street, New York, where it will do standard types of heat treating, diamond block high speed steel hardening, and atmospheric controlled hardening and flame hardening.

SKF Steels, Inc., New York, has appointed the New England High Carbon Wire Co. as sales representatives in Detroit territory. A complete line of tool steels will be carried at

a warehouse in Detroit, 6364 East Seven-Mile Road.

Lea Mfg. Co., Waterbury, Conn., has been appointed by General Abrasive Company, Inc., Niagara Falls, N. Y., as its exclusive representative in Connecticut and western Massachusetts for selling Lionite polishing grains. Complete stocks will be carried at Waterbury.

Laminated Shim Co., Inc., Long Island City, N. Y., has appointed Industrial Sales & Engineering Co., Houston, Tex., as exclusive agent in the Southwest for the sale of Laminum and other types of shims. J. H. Drapier and W. R. Davis are partners in the sales firm. The head office is in Houston, 501 Citizens State Bank Building.

Worthington Pump & Machinery Corp., Harrison, N. J., recently announced acquisition of an interest in the Moore Steam Turbine Corp., Wellsville, N. Y.

Brooks-Payne-Osborne Equipment Co., distributor for the Bucyrus-Erie Co., South Milwaukee, Wis., and the Day Pulverizer Co., both of Knoxville, Tenn., have consolidated to form the Brooks Equipment & Mfg. Co. This firm has its offices, factory, and warehouses at 410 Davenport Road, Knoxville.

The Terry Steam Turbine Co., Hartford, Conn., has appointed R. E. Chase & Co., Tacoma Building, Tacoma, Wash., with branch offices in Seattle, Portland and Spokane, as its representative.



• Cleveland Tramrail Cranes and Transfer Bridges are serving hundreds of machine and forge shops, tool rooms, etc. This one is equipped with a floor controlled electric hoist.

• Tramrail is a Pace Maker to Production — bringing up stock and removing finished product as fast as the machine requires. A safe Aid to increased production — it helps men to avoid the heavy and hard to handle lifts.

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... NEWS OF THE WEEK ...

Girdler Finds Events Justify His Fight Against John L. Lewis

FAIRMINDED and tolerant co-operation between employers and employees will help pull America out of the depression, Tom M. Girdler, Republic Steel Corp. chairman, declared this week in an address at the University of North Carolina, Chapel Hill, N. C.

Speaking on "The Way To Industrial Peace" only a few days before some other large steel companies are scheduled to begin (Feb. 7) formal negotiations with John L. Lewis' SWOC on steel wage contracts, Mr. Girdler said:

"What we have had to contend with in America in the recent past was labor leadership running wild.

"I think it is clear that the vast majority of American workers do not want to belong to unions for various reasons of their own."

Finds His Stand Supported

Explaining to his audience that because of the stand he took last summer (refusing to sign wage agreements with the SWOC) persistent efforts had been made to brand him as

an "extreme reactionary," Mr. Girdler gave in detail his views on labor relations. He said, in part:

"During the course of that strike (last summer) I said I would not sign a contract with the CIO because of its irresponsible leadership and its Communistic methods. I took that stand as a matter of principle. I believed I was right and my conviction since has been supported and confirmed by many events and disclosures.

"I need only cite the damning and conclusive testimony of a man like David Dubinsky (president, International Ladies Garment Workers, a CIO affiliate), who speaks from a knowledge gained from the inner councils of the CIO itself, or of a radical like Benjamin Stolberg, both of whom are now pointing to the insidious Communistic influences in the CIO.

"I am not saying this in any spirit of 'I told you so' but simply because it reveals how the cycle of events is running its course. We have had other 'one big union' movements in

this country. The Knights of Labor, the I.W.W.'s and all these have found, just as the CIO has found, that they were inconsistent with American ideas and their days were numbered. I am glad that the atmosphere is clearing on these matters, that the cold facts are being revealed in proper perspective and free from the heat of industrial conflict. Perhaps the way will now be cleared for the achievement of real industrial peace in this country. That is one of the great necessities if we are to have any true stability or prosperity in America.

Philosophy Unchanged

"Following a recent talk in which I gave my ideas as to the need for co-operation between Government and business, I have been amused to note the comments of various writers to the effect that evidently I had gone back on my whole philosophy. That is a mistake. My philosophy remains the same as it was before, and during, the steel strike.

"The fact is that because I did not agree with some people about the wisdom of signing a CIO contract, they assumed I disagreed with them about everything else. I have always believed that the welfare of the country required cooperation between Government and industry.

"In the first place, I believe it is

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A good inhibitor coupled with efficient pickling practice results in the following definite advantages:

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Saving in metal loss

Reduction of fuming

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A safety factor against over-pickling

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possible to have industrial peace. I believe in the principle of collective bargaining. I believe that industry should pay the highest wages, and provide the shortest hours with the best working conditions that are economically feasible. And I believe that all these can best be obtained under the capitalistic system.

"How are we to achieve the goal of industrial peace in this country? Is it through the compulsory unionization of all workers and the creation of

a class-conscious, militant union movement?

"When I say that is not the way, I am making no blanket indictment of unions. I know that many unions have served their members well and some of them unquestionably have acted for the good of the industry as well.

"However, in the mass production industries, such as steel and automobiles, unions have never gained a foothold among employees. Yet wages have constantly advanced and work-

ing conditions have been constantly improved. Since 1890, wage rates in the steel industry, for example, have increased 260 per cent, and the work-week has been reduced 44 per cent.

America Is Free

"The United States is still a free country. The fact of the matter is that no large employer, whether he wishes to or not, could succeed in dominating the thinking and allegiance of his employees and their families. And yet that is something which many of the so-called liberal thinkers in this country simply do not understand. They do not know the American worker and therefore they do not understand why he does not do what they think he should do.

"In the case of the CIO, we have it upon the word of Dubinsky that no more than 500,000 new dues-paying members have been added to the numbers already members of constituent unions.

"That can only mean that great numbers of employees in companies with CIO contracts have refused to join the union and pay dues to it.

"In my opinion it is important for the country today to realize that solution of the problem of industrial peace does not lie in the imposition of one particular brand of collective bargaining upon workers and upon industry."

Points to Dictatorship

Mr. Girdler warned that the philosophy of "one brand of collective bargaining" leads inevitably to a labor dictatorship, or labor monopoly, which would in fact destroy the individual freedom of the worker and make him merely a dues-paying cog in a semi-political machine. He said he believed that industrial peace in this country can be built upon the following four pillars:

- 1—Recognition of the principle of collective bargaining.
 - 2—Recognition of the rights of employees to join or not to join any organization of their own choosing, free from coercion from any source.
 - 3—Recognition that industrial relations are "human" relations and that cooperation between men and management and mutual understanding of each other's problems are both possible and essential.
 - 4—Legislation which will fairly protect the rights of both employees and employers.
- "In times like these, when the business horizon is filled with hesitation and uncertainty, people must stand to-

As your health depends on the Food you eat . . .



Your machines depend on the Gears you install!



WRITE FOR NEW CATALOG

Be as discriminating in your choice of gears as you are in your choice of diet! You must—to get the best out of machines.

Gears that are the best that money can buy; gears that are accurate, mesh perfectly, run smoothly. Gears that have a background of a "balanced diet" of good engineering—highest grade metals—meticulous care in machining every single tooth. Gears that are not just "good enough," but GOOD in the finest sense of the word. PHILADELPHIA GEARS, guaranteed by a maker of 45 years' reputation.



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gether and work toward common purposes which will help to pull this country out of the depression and put us on a firm footing of economic stability," Mr. Girdler said. Basic changes of our economic and political systems are not necessary, he concluded.

Picketing For Dues Closes Allegheny Plant Indefinitely

PITTSBURGH.—Interference of workmen by Steel Workers' Organizing Committee dues collectors, has resulted in an indefinite shutdown of the Allegheny Steel Co. plant at Brackenridge, Pa.

J. O. Carr, vice-president, last week told SWOC representatives "when the SWOC got to the point where they could forget all this business of picketing our gates and allow our employees to come back to work, then it would be time to talk about opening the plant, but we made no proposal of any description."

A meeting of union steel workers last week went on record for continuing collection of dues. Early last week between 50 and 100 employees of Allegheny Steel, including some union and non-union workmen, were told to go to the SWOC headquarters and either pay their dues or obtain a pass in case they were not paid.

Attempts are also being made to collect dues at Jones & Laughlin Steel Corp.'s Aliquippa, Pa., plant, where an independent organization is putting out hand bills telling employees they don't have to pay dues to any union in order to work.

Tin Output in 1937 Sets All-Time Record

PRELIMINARY figures for December, 1937, indicate that production of tin in that month amounted to 26,000 tons, making the total for the year 206,000 tons, an all-time record, according to the International Tin Research and Development Council. This compares with 180,000 in 1936 and exceeds the previous record established in 1929 by 7 per cent.

World consumption of tin in 1937, on the basis of data now available, was estimated by the council to have been 181,500 tons, as compared with 154,000 tons in 1936. In the 12-month

period ended November, 1937, tin consumption in the United States totaled 85,924 tons, a gain of 18.9 per cent over the similar period in 1936.

Ryerson Issues Handsome "Certified" Steel Booklet

JOSEPH T. RYERSON & SON, INC., has recently issued an unusual booklet entitled "Solving the

Problem of Quality Control." The pages are of Saturday Evening Post size, profusely illustrated. The material comprises a description of the Ryerson Certified steel plan, whereby users are provided with data sheets giving heat analysis and physical characteristics of each shipment of alloy steel, and in addition, a description of the various varieties of alloy steels and low carbon products handled by the company. The booklet will be mailed upon request.



HANDLING COSTS WERE
Cut in Half!
IN THIS WAREHOUSE

Here's the problem:
A warehouse where cultivator wheels are piled in 12-ft. stacks. Four men kept busy working six months every year. Work was slow, hard on men, heavy on the account sheet. Total storage cost—\$1900.80—NOT INCLUDING loss of time, or wear and tear on the workers.

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Asked for a proposal, P&H Engineers suggested a P&H XR-½ ton Hoist with 1000 lb. capacity, operating on a monorail. Final figures, after installation was made, showed a saving of \$885.16, including original cost, depreciation, upkeep and power!

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In just one simple item in this plant's operation, a P&H Hoist saved hundreds of dollars. It brought push-button simplicity and the economy of "thru the air" handling to an old job that was costly and tedious. A P&H Hoist may be the answer to YOUR handling problem—whether you operate a machine shop, ice plant, paper mill or any plant where material must be lifted, lowered and moved. Available in several mountings, P&H Hoists are easy to buy, easy to install and pay for themselves in a short time.

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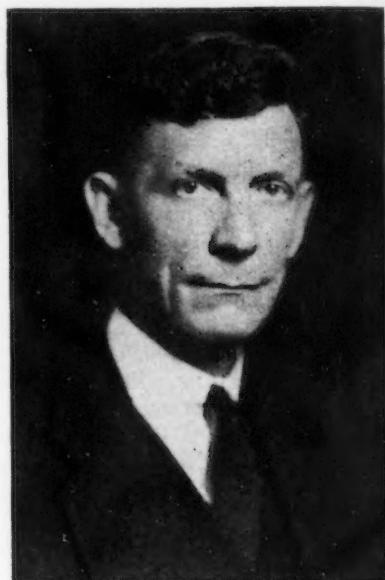
were being supplied to industry and considered then, as today, the most dependable product of its type.

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..PERSONALS..

HOWARD G. McILVRIED has been appointed general superintendent of the Irvin works of Carnegie-Illinois Steel Corp., Pittsburgh. He has been associated with subsidiary companies of the United States Steel Corp. for many years, having begun as a machinist at the Braddock, Pa., works of American Steel & Wire Co. He later worked in the engineering departments of American Steel & Wire, National Tube Co., Carnegie Steel Co., and American Sheet & Tin Plate Co. Mr. McIlvried was named chief engineer of the tin plate company in 1931 and later became assistant to vice-president. Upon consolidation of



H. G. McILVRIED

the sheet and tin company with Carnegie-Illinois, he was appointed assistant manager of Chicago district operations. In February, 1937, he was transferred to Pittsburgh as assistant to the manager of operations, which position he held until his present appointment.



CHARLES R. MOFFATT has been appointed director of advertising, United States Steel Corp. of Delaware, on the staff of C. V. McKAIG, vice-president. Mr. Moffatt has been advertising manager of Carnegie-Illinois Steel Corp., Pittsburgh, since that company was organized, Oct. 1, 1935, and has been a director of exhibits, U. S. Steel since July 1, 1935. He goes to his

new position after 31 years of service with subsidiary companies. He started in the accounting department of the Illinois Steel Co. at Chicago in 1907. In 1919 he assumed charge of sales statistics and advertising of that company, which position he held until his appointment in 1935.



JOHN HENRY SCHROEDER, who has been assistant traffic manager of the Tennessee Coal, Iron & Railroad Co. since Aug. 1, 1933, has been made traffic manager, succeeding A. W. CAREY, who has retired. Mr. Schroeder's connection with the Steel corporation began in 1914 when he joined the American Bridge Co. Before that he had been chief rate clerk with the



C. R. MOFFATT

Pennsylvania Railroad Co. Mr. Carey has served U. S. Steel subsidiaries for more than 38 years. His first position with the organization was that of chief clerk to the traffic manager of the National Tube Co., Pittsburgh. He was transferred to Kewanee, Ill., where he served for three years as traffic manager of the Western Tube Co. before being sent to Birmingham to join the Tennessee company. He was elected vice-president of the Birmingham Southern Railroad Co. in 1927, but resigned three years later when the railroad firm was separated from the Tennessee company.



GANO DUNN, president of the J. G. White Engineering Corp., was award-

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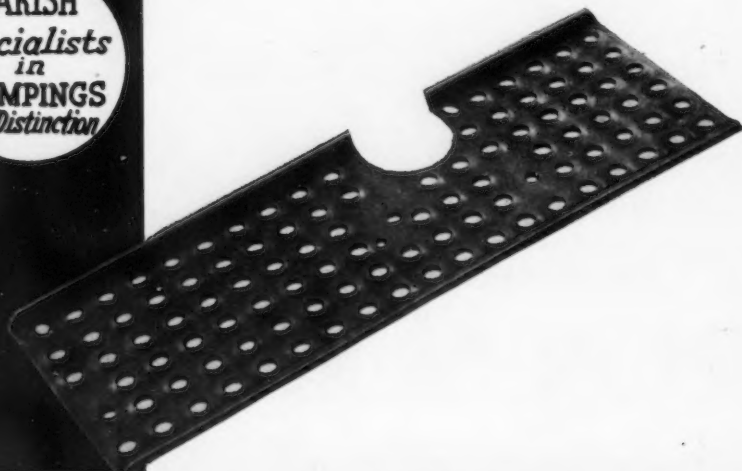
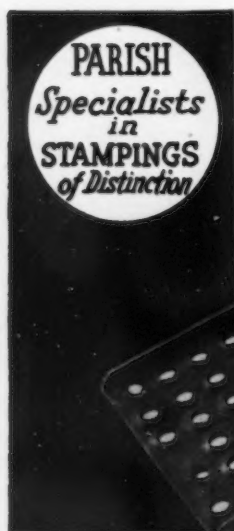
ed the Thomas A. Edison Medal of the American Institute of Electrical Engineers, on Jan. 26, at the institute's winter convention in New York. The award was made "for distinguished contributions in extending the science and art of electrical engineering, in the development of great engineering works, and inspiring leadership in the profession."

♦ ♦ ♦

BERNARD LESTER has been appointed manager of a newly-created resale de-

partment, Westinghouse Electric & Mfg. Co., East Pittsburgh, with headquarters at East Pittsburgh. He is a graduate of Haverford College and has been with Westinghouse since 1905, having been engaged in industrial sales and engineering activities. In his new position he will be responsible for the sale of Westinghouse equipment to manufacturers of machines powered or controlled electrically.

L. E. FEISNER has accepted a position as operating superintendent of the new continuous hot strip mill at Zaporozstal, Russia. A new 66-in. hot and cold strip mill at this plant is expected to go into operation about the end of February. Before this appointment Mr. Feisner was superintendent of the Jones & Laughlin Steel Corp.'s 96-in. hot strip mill, Pittsburgh. He started his career in the steel business at the Wheeling Steel Corp. in 1925 and, with the exception of a short period, remained with this company until 1936, at which time he entered the employ of Jones & Laughlin. When he left Wheeling in 1936



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B. LESTER



L. E. FEISNER

he was assistant superintendent of the hot strip mill department.



O. F. STROMAN has been appointed assistant to the vice-president in charge of sales, Westinghouse Electric & Mfg. Co., East Pittsburgh. Mr. Stroman has been an employee of the Westinghouse company since 1903 when he joined as a graduate of the Perkins School of Electricity. He has been active in company divisions that developed applications of electrical equipment to the industrial field. Since 1931 Mr. Stroman had been manager of the industrial sales department. His



O. F. STROMAN



C. R. HOOK

headquarters will be in the Pittsburgh offices of the company.

CHARLES R. HOOK, president of the American Rolling Mill Co., Middletown, Ohio, has been elected president of the National Association of Manufacturers for 1938. In addition, Mr. Hook is chairman of the special committee appointed recently to cooperate with the Government, Congress and other groups in seeking means for stimulating recovery and employment.

T. M. GIRDLER, chairman, Republic Steel Corp., has been elected a regional vice-president of the manufacturers association.



J. E. ANDRESS, heretofore president of the Barnes Drill Co., Rockford, Ill., has been made chairman of the board. Albert M. Johnson, the new president, has been with the company since its organization in 1907, and for the past several years has been chief



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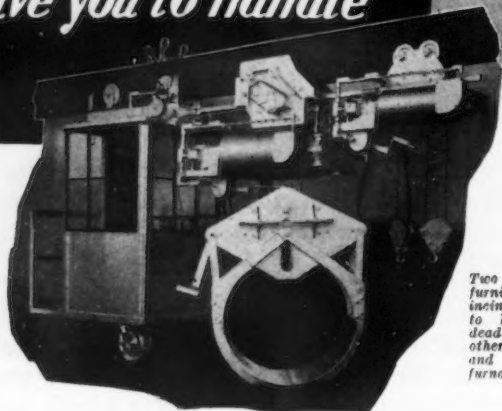
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other to remove
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engineer. W. M. Fairbairn, heretofore superintendent, has been elected first vice-president and works manager. Reed M. Address, who has been purchasing agent, has been made second vice-president and foreign sales manager, and A. G. Block is secretary and treasurer.

♦ ♦ ♦

MARK BEEMAN has been made executive secretary of the Concrete Reinforcing Steel Institute, Chicago, succeeding the late Richard W. Johnson. Mr. Beeman was the first secretary of the institute, serving in that capacity for eight years before becoming Washington manager of the Portland Cement Association. During the World War, Mr. Beeman was assistant director of film propaganda for the Government under the direction of the Creel committee.

♦ ♦ ♦

DAVID B. HILL has been appointed sales engineer specializing in foundry



M. BEEMAN

systems for the Chain Belt Co., Milwaukee. He is a mechanical and electrical engineering graduate of Clemson College and his experience covers the design, fabrication, installation, and sale of practically every type of conveyor. He will be located at the Chicago office of the company and will cover the Mid-West territory generally.

♦ ♦ ♦

A. A. PROBECK has returned to the Federal Machine & Welder Co., Warren, Ohio, as a special factory representative after an absence of one year, during which time he was asso-

ciated with Una Welding Co., Cleveland, as vice-president. Mr. Probeck has had more than 20 years' experience in sales of resistance welders.



JOSEPH W. ROBINSON is president of the recently organized Standard Electric Mfg. Corp., Toledo, Ohio, which will acquire the assets of the Standard Electric Stove Co., also of Toledo. JEFFERSON D. ROBINSON and CHARLES A. PIERSON have been announced as vice-presidents. ELLSWORTH TAIT and V. K. PERKINS will be treasurer and secretary, respectively, of the new organization. Mr. Robinson is a former president of the Libbey Glass Mfg. Co.



GEOFFREY R. BENNETT, for several years an executive of the Toledo Scale Co., Toledo, Ohio, has been made general manager of the company. For the past seven years he



D. B. HILL

has had general supervision of the shop and engineering department.



EARL C. ROBERTSON has been appointed vice-president in charge of sales, Pittsburgh Coal Co., Pittsburgh. He was formerly assistant sales manager, and in his new position succeeds HAL E. BOOTH, who recently resigned. Mr. Robertson has been associated with the Pittsburgh Coal Co. for the past 11 years.



DR. PAUL D. FOOTE, executive vice-president, Chemical Research & De-

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RIDGE PIPE TOOLS

velopment Co., Pittsburgh, addressed members of the Jones & Laughlin Steel Corp. Aliquippa Engineers Institute recently at Pittsburgh. Dr. Foote spoke on recent developments in prospecting new methods and equipment, production and transportation of crude oil, new processes for refining oil and new research and testing methods for oil qualities.

CECIL WARRENDER, who resigned recently as assistant director of the

rolling mill department of the Carnegie-Illinois Steel Corp. in Chicago, has been made superintendent of the slab and strip mills now under construction for Richard Thomas Tin Plate Co. at Ebbw Vale, Wales. He will sail from New York early this month.

GEORGE CALLOS has been appointed assistant manager in charge of sales promotion for the Allis-Chalmers Mfg. Co., Milwaukee. A. K. BIRCH is

assistant manager in charge of market analysis and sales organization service.

C. B. STAINBACK, has been appointed manager of the industrial sales department, Westinghouse Electric & Mfg. Co., East Pittsburgh, to succeed O. F. Stroman. He was formerly assistant manager and has been associated with Westinghouse since 1910, having spent the greater part of his career with sales activities concerning the electrification of industry. Mr. Stainback is a graduate of North Carolina State College. His headquarters will be in the Pittsburgh offices of the company.

CLARENCE C. STEVENS, mechanical superintendent, New Departure Division General Motors Corp., is to

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C. B. STAINBACK

present a talk on the application of hydraulics to machine tools on Feb. 8 before the New York-New Jersey chapter, American Society of Tool Engineers, at the Robert Treat Hotel, Newark.

C. H. PALMER, first vice-president and general sales manager of the National Screw & Mfg. Co., Cleveland, has retired, after an association of 40 years with the company. He has been sales manager of the company since 1911 and a vice-president since 1930. C. F. NEWPHER, formerly assistant to the president, now becomes vice-

president and general sales manager. He was formerly in charge of bolt and nut sales for the Upson division of the Republic Steel Corp. HOWARD T. BEIDLER, who has retired as secretary, has been with the company for 49 years. E. E. GRIESE, treasurer, has been made secretary-treasurer.



GILBERT J. KITCHING, JR., has become identified with Korbel & Colwell, Inc., public relations counsel, New York, and will specialize in financial and industrial lines.



EWART C. HUGH, formerly associated with the General Electric Vapor Lamp Co., has been appointed vice-president in charge of sales of the commercial lighting division of the Barkon-Frink Tube Lighting Corp.,



C. C. STEVENS

New York, which has been granted a license for the application of low pressure mercury tubes to commercial lighting.



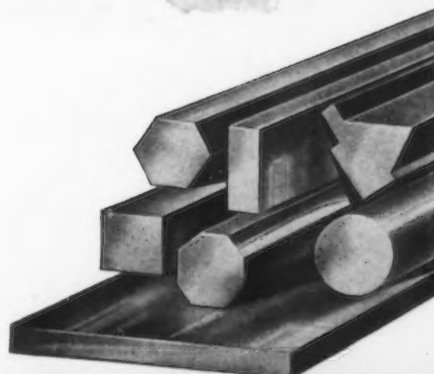
WALTER H. BRUCKNER has been appointed research associate in metallurgical engineering in the department of mining and metallurgical engineering in the Engineering Experiment Station of the University of Illinois. He was formerly engaged in metallurgical research, principally on the weldability of iron alloys at the United States Naval Research Laboratory in Washington.

MARSHALL POST, vice-president, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., will discuss "Castings by the Randupson Process" on Feb. 11 at the Engineers Club, Philadelphia, at a joint meeting of the Philadelphia and Reading chapters of the American Foundrymen's Association.



ROBERT C. STANLEY, president, International Nickel Co., New York, has been elected a trustee of the Mutual Life Insurance Co. of New York.

T. P. WRIGHT, vice president in charge of engineering of the Curtiss-Wright Corp., has been elected president of the Institute of Aeronautical Sciences, New York. Vice-presidents elected include: SHERMAN M. FAIRCHILD, president of the Fairchild Aviation Corp.; J. H. KINDELBERGER, president of North American Aviation; DR. E. P. LESLEY, of Stanford University, WILLIAM LITTLEWOOD, vice-president of American Airlines, and GEORGE J. MEAD, vice-president of the United Aircraft Corp. ELMER A.



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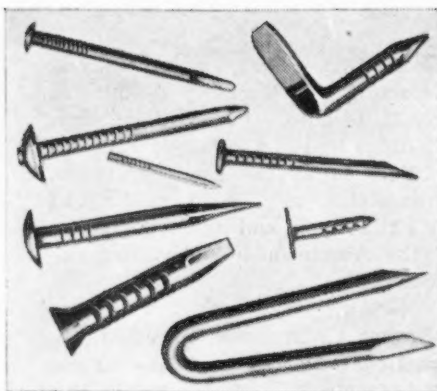
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SPERRY, of the Sperry Gyroscope Co., has been made treasurer.

♦ ♦ ♦

JOHN W. DIGNEIT, who celebrated his 80th birthday, Jan. 24, is still active as a consulting engineer for the Burroughs Adding Machine Co., Detroit. Born in St. Louis, Digneit's first employment was with the Boyer machine shop. Later with a group of eight men he went to Detroit as a consulting engineer for the Burroughs firm.

♦ ♦ ♦

VISCOUNT GREENWOOD, chairman of Dorman Long & Co., Middlesbrough, England, has been elected president of the British Iron and Steel Federation and will take office in March.

♦ ♦ ♦

DR. LEO H. BAEKELAND, honorary professor of chemical engineering at Columbia University and discoverer of bakelite, has won the 1938 Messel medal of the British Society of Chemical Engineering for "outstanding advancement in science."

♦ ♦ ♦

H. D. FOSTER who has been sales representative in the Cleveland territory for the mechanical goods department of the Goodyear Tire & Rubber Co., Akron, has been made manager of the newly-opened Cleveland office. W. L. CLARK will succeed him as Cleveland territory salesman.

♦ ♦ ♦

J. M. MCCLURE has been elected vice-president of the Minneapolis Iron Store Co., Minneapolis, succeeding the late S. L. Sewall. SAMUEL SEWALL has been made treasurer.

♦ ♦ ♦

FLAVEL W. WOODWORTH was honored on Jan. 22 on his 87th birthday as the oldest employee of the Pratt & Whitney, Division Niles-Bement-Pond Co., Hartford, Conn. The occasion marked the 70th anniversary of his association with the company.

**Armco Releases Film
On "Romance Of Steel"**

THE story sheet iron and steel, from iron ore to finished products, is told in a sound film just released by the American Rolling Mill Co., Middletown, Ohio. Entitled "The Romance of Iron and Steel," the film is available to Armco customers, groups of distributors, engineers, architects, industrial clubs, purchasing agents and sales organizations. It is available in both 16-mm. and 35-mm.

New Handbook of Rustless Stainless Steels

THE Rustless Iron & Steel Corp., Baltimore, Md., has just issued a handsome spirally bound handbook under the above title.

The book is divided into four sections. The first is an introductory section defining the various types of Rustless stainless steels and also containing information for ordering.

The second section contains detailed data as to the chemical and physical properties of the various specialized Rustless stainless steels made by the corporation.

The third section comprises useful data for the user and fabricator including information as to machining and cutting, heat treatment, forging, cold working, welding, brazing, etc.

The fourth section is an engineering data section which deals with corrosion, galvanic and electrolytic resistance, chemical composition of S.A.E. corrosion and heat resisting alloys, section tolerances, weights, dimensions, gages, etc.

Japanese Lecture On Surface Hardening

DR. MASUO KAWAKAMI, of the research laboratory of the Tokyo University of Engineering, has discovered that cementation-nitriding in fused cyanide can be done by electrolysis better than by simple dipping. The results of his study were announced last month at a lecture meeting of the Japan Institute of Metals, in Tokyo.

The lecture indicated that if steel is left immersed in fused cyanide, cementation and nitriding take place simultaneously on the surface; hence the phenomenon is designated as cementation-nitriding. This treatment not only hardens the surface of steel and iron but also imparts higher resistance to corrosion. If electrolysis is employed with the steel as the cathode, the action is markedly accelerated.

Steel Founder's Society Annual Meeting Feb. 9-10

THE Steel Founders' Society of America will hold its annual meeting at Hotel Statler, Cleveland, Feb. 9 and 10. R. L. Collier, 920 Midland Building, Cleveland, is secretary.



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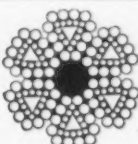
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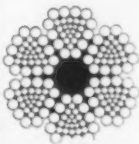
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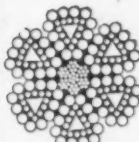
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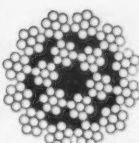
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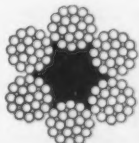
Wire Rope Center



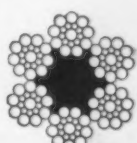
Steel Clad



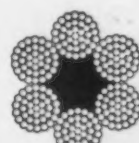
18x7
Non-Rotating



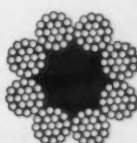
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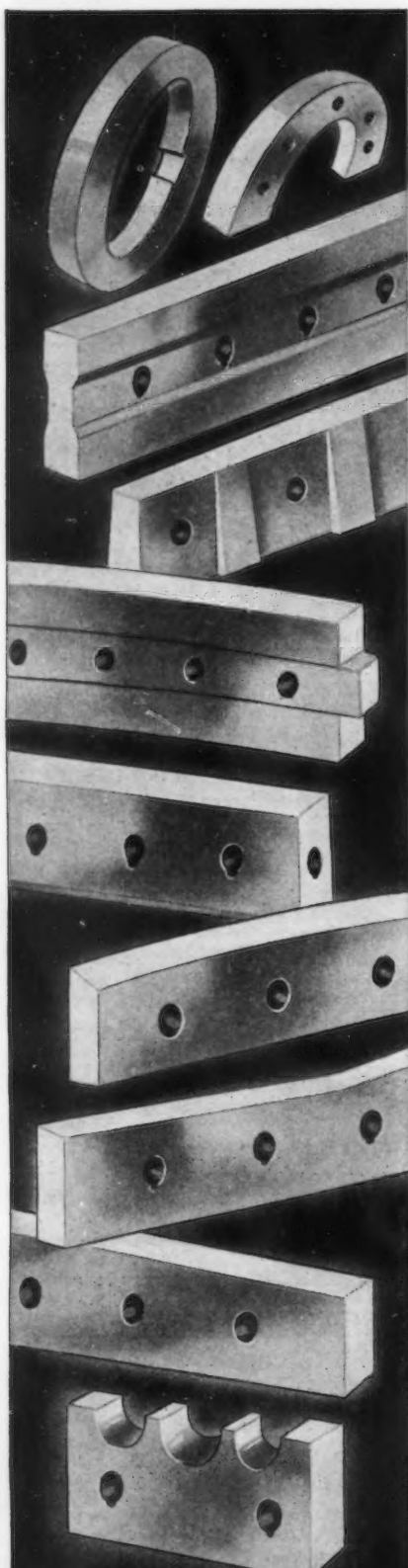
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Bethlehem Has Not Proposed Slash In Wages, Grace Says

BETHLEHEM STEEL CORP. has "not proposed any reduction in wage rates or discussed that subject with its employees," Eugene G. Grace, president, said following a directors' meeting in which Bethlehem's fourth quarter earnings were reported at \$4,253,329, or 76c. a common share.

"I hope it won't be necessary," said Mr. Grace. "It is interesting to note, however, that wage rates now prevailing are the highest of all time with the average hourly earnings 31 per cent above 1929 and with more actual money in the pay envelope in 1937, when the men averaged 37 hr. per week, than in 1929, when they averaged 48 hr. per week."

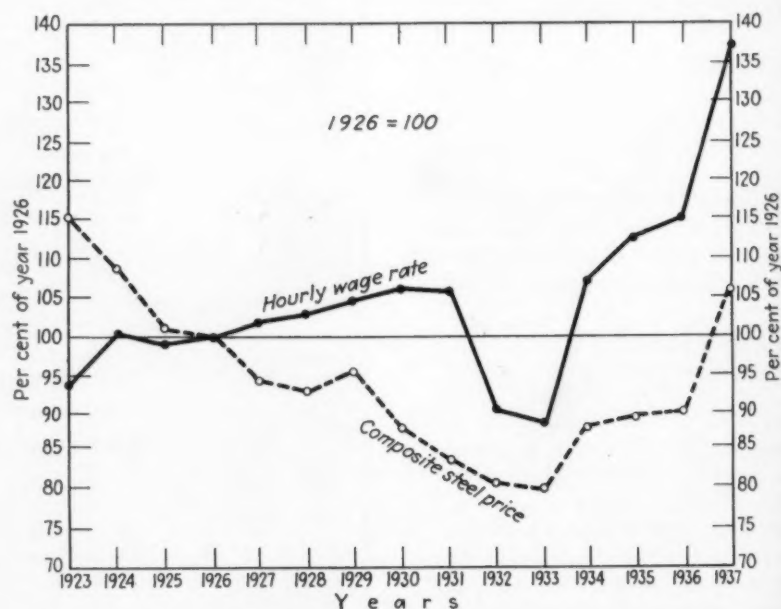
How Wages, Prices Compare

To explain how wages have risen more than steel prices since 1923, Mr. Grace compared the average price of

steel products as shown in *THE IRON AGE* with average wage rates paid by Bethlehem Steel. His tabulation follows:

Year	Iron Age price, cents per lb.	Average wage rate, cents per hr.
1923	2.775	58.8
1924	2.602	62.7
1925	2.438	62.2
1926	2.409	62.6
1927	2.286	63.8
1928	2.254	64.2
1929	2.297	65.4
1930	2.111	66.6
1931	2.016	66.4
1932	1.957	56.6
1933	1.943	55.4
1934	2.103	67.4
1935	2.126	70.7
1936	2.148	72.1
1937	2.555	86.0

"No business could long survive selling its products at a price less than the cost of producing them," Mr. Grace said. "It would seem axiomatic



DATA presented by E. C. Grace, president, Bethlehem Steel Corp., based on the yearly averages of *THE IRON AGE* finished steel composite price and the average hourly wage rate of the corporation showed that in the four years from 1933 to 1937 the hourly wage rate had advanced from 88.5 per cent of the 1926 average to 137.4 per cent, while in the same period steel prices rose from 80.7 to 106.0.

to me that it was an obligation on the part of management to the owners of a business to see to it that selling prices were related to costs in a manner to provide income in excess of outgo. In other words, to insure a solvent business we must balance our budget.

"It will, I think, be obvious from a few figures that prices cannot be materially reduced without adversely affecting wages, which are such a large part of costs. In 1937 Bethlehem's gross business was \$418,000,000; net income after all charges was approximately \$32,000,000, representing a margin of profit of less than 8 per cent on the gross business, which incidentally, was approximately 6 per cent return upon the investment in the business; in other words, a reduction of 8 per cent in our billing prices in 1937 would have wiped out all profits for the stockholders. Nineteen hundred and thirty-seven was the second largest year in volume in the history of our company. Present indications are that the volume this year will be substantially reduced.

Stabilized Schedules Difficult

"I wish it were possible to have a more uniform rate of operations in our business. Ours is a basic industry, however, depending upon a multiplicity of consuming and processing industries for the consumption of its products.

"The character of our industry," Mr. Grace said, "precludes any important accumulation of manufactured products awaiting orders. It must, therefore, be operated against current demand which makes it impracticable for our industry to do much toward establishing a uniform rate of operations."

Mr. Grace said he sees nothing to indicate an important change in demand for steel, a situation he finds "not due to prices." Bethlehem is receiving orders for steel at the rate of 26 per cent of capacity while its mills are operating at 32 per cent. He said he found prices holding "like the Rock of Gibraltar."

Output 45.7 Per Cent

With his report, showing Bethlehem earned a net income of \$31,819,596 in 1937 (second highest in its history) compared with \$13,901,006 in 1936, Mr. Grace said that ingot production during the last quarter of 1937 averaged 45.7 per cent of capacity, com-

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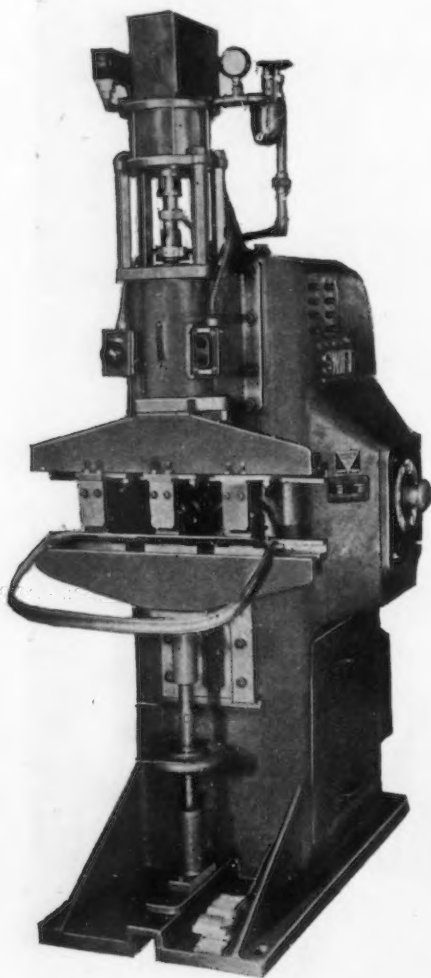
AMERICAN SPRING

AND MANUFACTURING CORPORATION

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pared with 85.1 per cent in the previous quarter, and averaged 77.7 per cent for the entire year, compared with 64 per cent for 1936. Cash expenditures for additions and improvements last year were \$45,048,836. Estimated cost of completing construction authorized or under way Dec. 31 was \$4,548,700.

On Jan. 1 Bethlehem's ingot capacity was 10,042,000 tons against 9,360,000 tons at the beginning of 1937 and unfilled orders totaled \$93,470,063 compared with \$125,820,124 on Oct. 1, 1937.



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Many Phases of Shop Problems Discussed by Tool Engineers

DURING January, many engineers prominent in the machine tool industry took part as speakers at several chapter meetings of the American Society of Tool Engineers. Subjects covered all angles of production engineering. The society now has 14 chapters carrying on active monthly programs of technical meetings, and in addition is planning a national convention and exhibition, to be held in Detroit, March 9 to 12.

Carl Swanson and T. B. Buell of Sundstrand Machine Tool Co., were the featured speakers at the Jan. 13 meeting of the Detroit chapter. Swanson explained the functioning of Sundstrand's new hydraulic power mechanism which incorporates a self-actuating booster pump. By means of this pump which has no mechanical drive, pressures are stepped up from 50 to 1000 lb. per sq. in. for operating machinery, etc. In a motion picture by Sundstrand which followed, interest centered on that company's new "Process Miller," an entirely automatic machine which completely mills all the surfaces of a cylinder block, without requiring any handling on the part of operators. Ford Lamb, executive secretary of the A.S.T.E., announced plans for the Machine Tool and Equipment Exhibition scheduled in connection with its first annual membership convention.

Cemented carbide tipped tools should always be kept in motion during grinding, according to L. J. St. Clair, Carboloy Co., Inc., who addressed the Bridgeport chapter meeting. Mr. St. Clair set up a number of simple rules to follow in the designing, brazing and grinding of carbide tools. Among these were: Wheel speeds should be approximately 5000 r.p.m.; the tip should never be dipped in water; the top rake should be ground first; only moderate pressure should be used; tools should always be ground against the cutting edge of the tool from tip to shank. In designing tools, the tip should receive maximum support possible since carbides will not bend, but will break if the shank deflects. Carbon tetra-chloride was recommended as the best agent in brazing.

A scale of standards for surface finishes was proposed by James Weaver, director of equipment, Westinghouse Electric & Mfg. Co., in addressing the New York-New Jersey chapter. According to the proposed scheme, finish grades would be divided into 10 classifications, ranging from 0 for the roughest, to 9 for the smoothest. "0" would designate a surface finish with an average depth of scratches, tool marks or serrations of 0.063 in.; "9" would designate a surface with scratches of approximately four millionths of an inch.



L. J. ST. CLAIR (right), of the Carboloy Co., talked on the application of cemented carbides before the Bridgeport Chapter of the A.S.T.E. Seated is C. A. Dumore, tool supervisor of Underwood-Elliott Fisher Co., and secretary of the chapter. Standing at left is John Bullard, of the Bullard Co., and chapter chairman.

depth. This is somewhat coarser than a finely lapped surface. Johansson gage blocks, for instance, have a standard of one millionth of an inch for surface marks. Instruments for measuring surface marks are already available, Mr. Weaver said. The subject is to be aired at length at one of the technical sessions of the annual convention.

Mr. Weaver also spoke on the assigned topic of welded jigs. He traced the development of this technique as developed at Westinghouse some years ago under his supervision.

Influence on Electrical Design

The increasing importance of machinery manufacturers as an influence on the design of electrical equipment was discussed by W. D. Turnbull, manager, machinery electrification section of Westinghouse, in a recent address before the Pittsburgh chapter. Motor requirements have advanced from the single motor for line-shaft drive, costing \$20 to \$30 per machine in the line, to the latest multi-motor drive, where the average value of the electrical equipment is about \$2,000 per machine.

The control has also advanced from the simple requirement of some means of starting and stopping the motor, such as an across-the-line starter, to a scheme of control requiring contactors, relays and interlocks, to give automatic or semi-automatic operation and provide in some cases sequence of operation, with protection to the operator and machine.

Mr. Turnbull stated that this continually increasing market has probably had more effect in influencing the design of the general line of electrical equipment than any other single industry. He showed how both motors and controllers had been continually reduced in size and various mountings developed to meet the requirements of the machinery manufacturers. He also demonstrated the large number of different types of motors designed to suit the various applications.

Harry A. Moore, general sales manager, Foster Machine Co., spoke at the January meeting of the Buffalo chapter, which celebrates its first anniversary in February. It has scheduled Howard R. Mellor, lubricating engineer, Socony-Vacuum Oil Corp. to speak at its meeting there.

Announcement has been made by the Cleveland chapter that special railroad and hotel rates are available in connection with the annual convention and exhibition to be held in De-

troit. The committee in charge of arrangements includes P. F. Zerkle and J. Balkwill of Production Tool Co.; C. V. Briner, Pratt & Whitney; G. J. Hawkey, Cleveland Duplex Machine Co.; Andrew Black, White Motor Co.; Ed Mason, Cleveland Worm & Gear Co.; H. P. Boggis, H. P. Boggis Co.; F. Denning, Jr., Denning Mfg. Co.; C. Mahrer, Lucas Machine

Tool Co.; Ed. Linderoth, Barber-Colman Co.; and R. B. Oswell, Clark Controller Co.

E. M. Reiniger, Cincinnati Milling Machine Co. and Cincinnati Grinders, Inc., spoke at the January meeting of the Baltimore chapter. Francis D. Bowman, advertising manager for the Carborundum Co., will speak at the February meeting.

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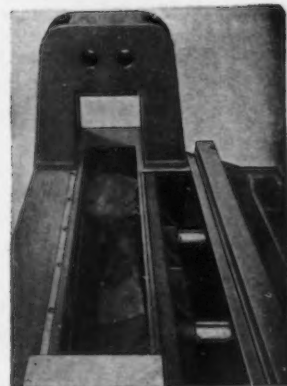
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Current Metal Working Activity

Latest Data Assembled by THE IRON AGE from Recognized Sources.

	December 1937	November 1937	December 1936	Twelve Months 1936	Twelve Months 1937
Steel Ingots: (gross tons)					
Monthly output ^a	1,472,241	2,153,781	4,424,367	46,807,780	49,507,766
Average weekly output ^a	333,086	502,047	1,000,988	895,329	949,516
Per cent of capacity ^a	25.36	38.22	76.42	68.36	72.39
Pig Iron: (gross tons)					
Monthly output ^b	1,490,324	2,006,724	3,115,037	30,618,797	36,611,317
Raw Materials:					
Coke output ^c (net tons)	2,996,525	3,395,956	4,599,700	46,275,200	52,362,098
Lake ore consumed ^d (gross tons)	1,916,588	2,734,504	4,551,379	44,639,318	53,996,076
Castings: (net tons)					
Malleable, production ^e .....	.....	32,457	61,674	571,696	.....
Malleable, orders ^e .....	.....	28,170	67,035	576,334	.....
Steel, production ^e .....	.....	47,100	83,615	805,691	.....
Steel, orders ^e .....	.....	31,397	159,430	909,080	.....
Finished Steel: (net tons)					
Trackwork shipments ^a	3,804	4,289	5,579	68,813	92,121
Fabricated shape orders ^f	99,070	132,835	166,542	1,609,016	1,628,641
Fabricated shape shipments ^f	108,396	130,156	121,775	1,548,205	1,660,570
Fabricated plate orders ^f .....	.....	27,507	51,017	484,038	.....
U. S. Steel Corp. shipments ^g	489,070	587,241	1,067,365	10,784,273	12,825,467
Ohio River steel shipments ^h	67,875	70,600	111,450	1,169,321	1,305,870
Fabricated Products:					
Automobile production ⁱ	346,886	376,637	519,132	4,616,857	5,016,565
Construction contracts ^j	\$209,451†	\$198,465†	\$199,696†	\$2,675,296†	\$2,913,060†
Steel barrels shipped ^k .....	.....	752,830	895,481	8,600,493	.....
Steel furniture shipments ^l .....	.....	\$1,933†	\$2,113†	\$19,246†	.....
Steel boiler orders ^m (sq. ft.) .....	.....	595,506	1,872,139	11,511,557	.....
Locomotives ordered ⁿ	77	13	112	533	368
Freight cars ordered ⁿ	3,287	1,625	19,035	68,341	52,788
Machine tool index ^o	142.7	127.7	257.7	201.7†	140.8†
Foundry equipment index ^o	111.2	128.0	283.3	219.3†	142.4†
Non-Ferrous Metals: (net tons)					
Lead shipments ^a	34,020	33,853	51,646	513,361	575,933
Lead stocks ^a	129,131	113,573	171,856	.....	.....
Zinc shipments ^a	29,545	32,676	59,512	561,969	570,111
Zinc stocks ^a	64,776	42,534	44,955	.....	.....
Tin deliveries ^p (gross tons)	5,020	5,195	6,930	74,005	83,665
Refined copper deliveries ^q	22,231	37,025	89,076	819,007	865,336
Refined copper stocks ^q	259,908	221,676	161,068	.....	.....
Exports: (gross tons)					
Total iron and steel ^r .....	.....	556,591	244,156	3,162,694	.....
All rolled steel ^r .....	.....	263,418	126,173	1,167,244	.....
Finished steel ^r .....	.....	218,777	117,979	1,040,815	.....
Scrap ^r .....	.....	254,072	109,026	1,941,031	.....
Imports: (gross tons)					
Total iron and steel ^r .....	.....	26,996	52,584	666,838	.....
Pig iron ^r .....	.....	6,661	10,423	165,909	.....
All rolled steel ^r .....	.....	15,592	19,968	270,594	.....
British Production: (gross tons)					
Pig iron ^s	783,800	762,300	671,400	7,681,600	8,495,200
Steel Ingots ^s	1,103,800	1,178,300	1,019,200	11,699,000	12,964,000

†Three months' average. ‡000 omitted.

Source of data: ^aAmerican Iron and Steel Institute; ^bTHE IRON AGE; ^cBureau of Mines; ^dLake Superior Iron Ore Association; ^eBureau of the Census; ^fAmerican Institute of Steel Construction; ^gUnited States Steel Corp.; ^hUnited States Engineer, Pittsburgh; ⁱPreliminary figures from Automobile Manufacturers Association—Final figures from Bureau of the Census, U. S. and Canada; ^jF. W. Dodge Corp.—37 Eastern states; ^kRailway Age; ^lNational Machine Tool Builders Association; ^mFoundry Equipment Manufacturers Association; ⁿAmerican Bureau of Metal Statistics; ^oAmerican Zinc Institute, Inc.; ^pNew York Commodities Exchange; ^qCopper Institute; ^rDepartment of Commerce; ^sBritish Iron and Steel Federation.

Index Recedes as Automobile Assemblies Drop



THE IRON AGE Weekly Index of Capital Goods Activity

(1925-27 = 100)

	Week Ended Jan. 29	Week Ended Jan. 22	Comparable Week	
			1937	1929
Steel ingot production	45.4	44.2	107.8	117.5
Automobile production	63.2	70.0	81.7	137.5
Construction contracts	66.8	65.5	75.5	120.4
Forest products carloadings	55.4	54.5	60.9	127.2
Production and shipments, Pittsburgh District	53.5	52.7	103.4	117.7
Combined index	56.9	57.4	85.9	124.1

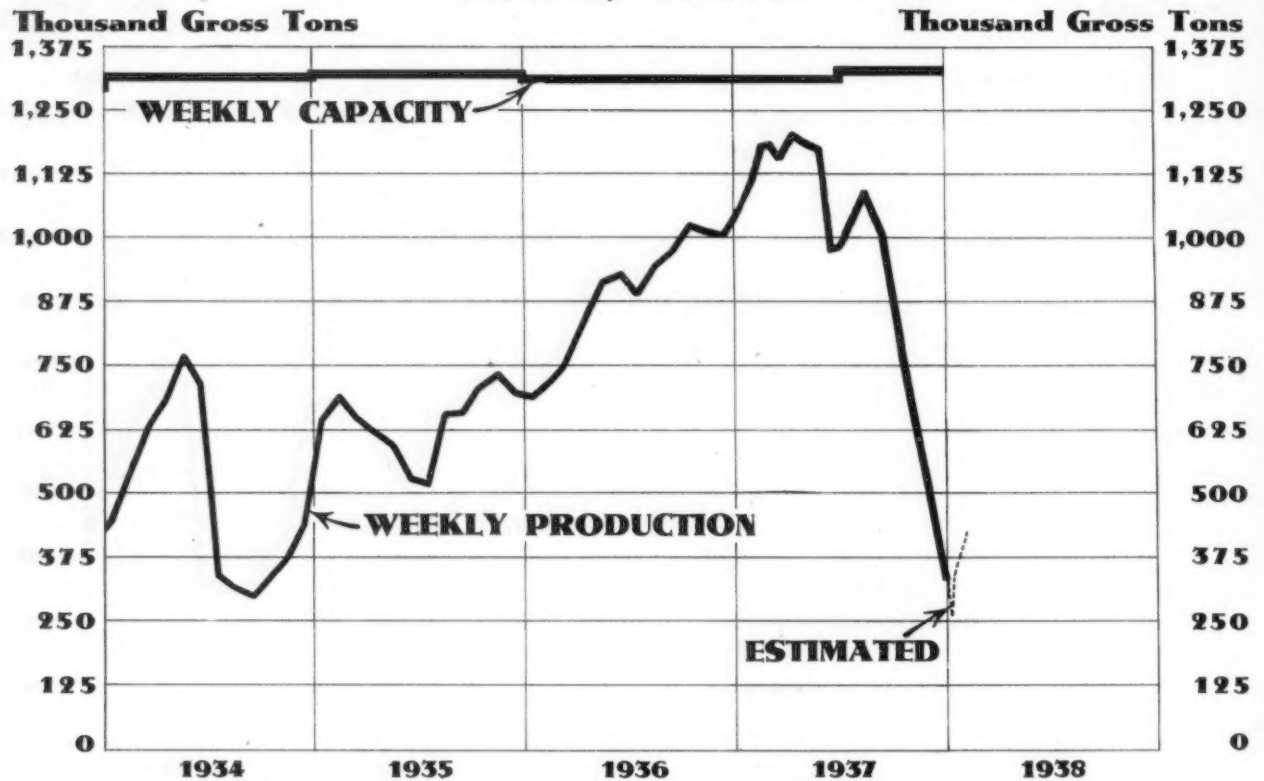
A DECLINE in automobile assemblies of 6053 units to 59,365 for the week ended Jan. 29 was responsible for a drop of 0.5 points in THE IRON AGE seasonally adjusted index of capital goods activity. In the comparable week a year ago automobile assemblies totaled 76,620 units. Following an advance of 6.1 points in the week of Jan. 15, the heaviest upward movement in five months, the index has declined a total of 0.6 points and now stands at 56.9 per cent of the base years. The seasonally adjusted decline of the automobile series was 6.8 points, while the gains in the other four components totaled only 3.6 points. In the gains made during the week, the largest gain was recorded by the heavy construction

series. An increase in the dollar volume of construction awards of \$3,080,000 over the previous week moved the index number of this component up 1.3 points to 66.8. Ten large commercial and industrial building contracts, aggregating \$11,882,000, were largely responsible for the week's gain. The volume of construction awards in the week ended Jan. 29 was 40 per cent above a similar week in 1937. It is interesting to note that in 1937 the index started the year at 100.2 and declined progressively 14.3 points in the first five weeks to 85.9. In the first week of the current year the index stood at 54.7 and after one advance and four small declines shows a net gain for the year to date of 2.2 points.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from Engineering News-Record.

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1938



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

	Current Week	Last Week
Pittsburgh	30.0	29.0
Chicago	25.0	27.0
Valleys	26.0	31.0
Philadelphia	29.0	29.0
Cleveland	26.0	30.0
Buffalo	14.0	23.0
Wheeling	60.0	52.0
Southern	46.0	46.0
Ohio River	57.0	28.0
Western	40.0	40.0
St. Louis	27.0	25.0
Detroit	42.5	46.0
Eastern	10.0	10.0
Aggregate	32.5	32.5

Weekly Booking of Construction Steel

	Feb. 1, 1938	Jan. 25, 1938	Jan. 4, 1938	Feb. 2, 1937	Year to Date 1938	Year to Date 1937
Fabricated structural steel awards.....	18,400	12,550	11,700	18,910	69,200	140,035
Fabricated plate awards.....	9,075	360	0	4,175	14,315	16,015
Steel sheet piling awards.....	0	1,815	0	4,800	1,815	8,950
Reinforcing bar awards.....	6,955	845	1,660	4,030	23,515	14,250
Total Lettings of Construction Steel.....	34,430	15,570	13,360	31,915	108,845	179,250

...SUMMARY OF THE WEEK...

... *Buyers' caution intensified by wage-price discussion.*

o o o

... *Some companies reduce salaried workers; one cuts wages 20 per cent.*

o o o

... *Automobile industry at slow pace; Chrysler shut down.*

CAUTION among steel buyers has been intensified by the recent statement from President Roosevelt on the subject of wages and prices. While a survey conducted by one large steel company among its customers disclosed virtually unanimous opposition to a reduction in steel prices at the present time, the fact stands out that scarcely any are willing to add to their steel inventories until the issue of both wages and prices is determined by the result of the negotiations which start next Monday between the United States Steel Corp. and the Steel Workers Organizing Committee for renewal of the existing labor contract.

Whether the action of the United States Steel Corp. and the Jones & Laughlin Steel Corp., the two largest signatories of SWOC contracts, in reducing working time of all salaried employees, points to a wage reduction for mill workers cannot be even surmised from any available information, the position that the steel companies may take in the forthcoming wage conference being a closely guarded secret. Only one steel company of those not governed by labor contracts has reduced wages, the Wickwire-Spencer Steel Co., which has announced a cut of 20 per cent for both salary and wage earners.

After four weeks of slowly advancing steel operations, the ingot production rate this week has declined one and a half points to an indicated 31 per cent. Under present conditions of irregular operations, accurate estimates are difficult because some open hearths are run for two or three days a week, so that the rate in the middle of the week may be higher than in the beginning or end.

The fluctuations by districts well illustrate the present buying condition. The Pittsburgh district has moved up one point this week to 30 per cent, while the almost equally important Chicago area has lost two points to 25 per cent. Other districts to show losses are the Ohio Valleys, Cleveland-Lorain, Buffalo and Detroit. Partly counteracting these are increases in the Wheeling-Weirton area,

up eight points to 60 per cent; the southern Ohio district, which has gained 29 points to 57 per cent, and the St. Louis district, up two points to 27 per cent.

Not only are the miscellaneous buyers holding back, even when their inventories of steel are low, but the automobile industry and the railroads, two of the major consuming channels, are taking next to nothing. The automobile industry's February output will be less than that of January. The Chrysler plants are shut down until February 8, with their schedule for the remainder of the month uncertain.

Railroads are releasing very little steel even against their normal maintenance requirements, and there has been no more substantial rail tonnage, rolling of which has contributed largely to the gain that ingot production made in January. However, the Missouri Pacific has received court authorization to spend \$7,540,088 for rails and accessories, bridges and trestles and shop equipment. The Milwaukee Road, at work on rebuilding 1000 cars in its own shops, may increase the number to 1500. The Grand Trunk Western has ordered six passenger locomotives from Lima. Pullman-Standard has received an order for 250 cars and 95 underframes from the Central Railways of Brazil.

Government work looms large both at present and in prospect in the construction field. Of 80,000 tons of steel that will be bought for the Grand Coulee Dam by the United States Bureau of Reclamation, 8373 tons for penstocks to be built by the Western Pipe & Steel Co., San Francisco, and 1700 tons of reinforcing bars, to be furnished by Columbia Steel Co., have been awarded, while bids on remaining requirements will be taken shortly. Structural steel lettings of 18,400 tons in the week include 6000 tons for a building in Rockefeller Center, New York. New projects of 20,000 tons are headed by 4500 tons for Queens-Manhattan tunnel approaches, New York, and 3400 tons for a bridge at Jacksonville, Fla. Publicly financed work predominates in construction activity.

The proposed naval construction program will take 400,000 tons of steel, including special steels, forgings, armor plate, machinery, etc., but much of this would be spread over a long period, as it takes about three years to build capital ships. The navy has awarded 13,700 tons of armor plate to three companies.

Reflecting fresh uncertainty in the immediate steel outlook, scrap markets have developed a few weak spots, which would be more pronounced except for export demand. Heavy melting steel has declined 50c. a ton at Cleveland, but THE IRON AGE composite, which is an average of Pittsburgh, Chicago and Philadelphia, is unchanged at \$14.

...PITTSBURGH...

... *Steel ingot output at 60% in Wheeling-Weirton area.*

o o o

... *Outlook for automotive buying this month uncertain.*

o o o

... *Buying spotty and light as buyers await wage action.*

PITTSBURGH, Feb. 1.—Steel ingot output in the Pittsburgh district this week has moved up fractionally to 30 per cent of capacity. Operating rates at individual plants continue exceptionally irregular and in most cases no definite trend is discernible as schedules are made up almost on a day-to-day basis. Wheeling-Weirton ingot output is up eight points to 60 per cent of capacity. A fair portion of the steel being made in that district is for inventories in anticipation of spring demand.

In practically all cases the volume of incoming business during January ran ahead of December. While the increase in some instances was as high as 20 per cent, the improvement from a tonnage standpoint was not very impressive as December was so poor. Finished steel specifications during the past week were about on a par with the previous week. Customers are demanding immediate shipment on hand-to-mouth purchases, which results in a considerable number of operating difficulties at finishing mills.

Some automobile parts makers are pushing back shipping dates as much as one month on certain bar items, and the outlook for automotive buying during February is uncertain.

Galvanized sheet producers have revised quantity deductions on lighter gages of formed roofing and siding from 15c. a 100 lb. to 20c., making a \$4 a ton quantity discount on minimum carload lots.

Mill prices on finished steel products continue to hold firm. No buying of any consequence, however, is expected until after negotiations with Steel Workers Organizing Committee have been concluded.

Pig Iron

Tonnages placed during the past week were individually small but orders were more numerous. This con-

dition reflects the low point of consumers' stocks rather than improvement in operations. A marked increase in activity at customers' plants will immediately influence the volume of incoming pig iron business.

Semi-Finished Steel

No notable increase in bookings has materialized but the volume of new business has shown some improvement during the past few weeks. Despite a sluggish sheet market, stocks at non-integrated makers' plants have reached the point where some replenishment of sheet bar inventories has been found necessary.

Bars

Total tonnages placed in January were greater than December volume but individual orders involved were not large. Specifications continue to be of the fill-in variety with jobbers and farm implement makers accounting for a good share of current business.

Cold Finished Bars

Orders during the past week have increased slightly without benefit of automotive bookings. Some automotive parts makers have pushed back shipments as much as one month. Not much support is expected from automobile makers during the next three or four weeks but a pickup in miscellaneous bookings is anticipated.

Reinforcing Bars

Awards were fairly numerous during the past week but tonnages involved were not large. A hospital project at Pittsburgh involving 350 tons was awarded to Sweet's Steel Co., Williamsport, Pa.

Plates and Shapes

The American Bridge Co., Pittsburgh, will furnish 1350 tons of material for TVA transmission towers. The

majority of current projects are publicly financed. Inquiries are fairly numerous and involve some fair-sized tonnages.

Sheets and Strip

Quantity deductions on minimum carload lots of galvanized roofing and siding have been advanced from 15c. a 100 lb. to 20c. a 100 lb., making the quantity discount amount to \$4 a ton. Sheet specifications are in no better volume than a week ago and miscellaneous demand continues sluggish. The placing of at least one moderate sized sheet order recently by a large motor maker at published quotations can probably be interpreted as a test of present prices. Demand for strip steel has shown no improvement during the past week.

Tin Plate

Tin plate operations are estimated at 30 to 35 per cent of capacity. New business during the past week shows little change from recent activity.

Tubular Goods

Demand for tubular goods is unchanged from a week ago. Emphasis is still on stock replenishment with orders for immediate consumption being of the fill-in variety.

Wire

Merchant wire business continues to show further slight improvement but demand for manufacturers' wire has receded during the past week. Specifications for the latter item are influenced somewhat by a reduction in automotive production.

Coal and Coke

Close to 200 beehive furnace coke ovens in the Connellsville region have been taken out of operation during the past week. Demand for furnace and foundry coke is exceptionally dull. The absence of industrial coal demand, coupled with heavy domestic requirements, has resulted in an unwieldy accumulation of slack in this district.

Bonomo, Schwartz At President's Conference

MICHAEL V. BONOMO, of Schiavone-Bonomo Corp., and Benjamin Schwartz, president and director general respectively of the Institute of Scrap Iron and Steel, attended Wednesday's conference of industry in Washington called by President Roosevelt.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Feb. 1, 1938	Jan. 25, 1938	Jan. 4, 1938	Feb. 2, 1937
Rails, heavy, at mill.....	\$42.50	\$42.50	\$42.50	\$39.00
Light rails, Pittsburgh	43.00	43.00	43.00	38.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	34.00
Sheets, bars, Pittsburgh.....	37.00	37.00	37.00	34.00
Slabs, Pittsburgh	37.00	37.00	37.00	34.00
Forging billets, P'gh.....	43.00	43.00	43.00	40.00
Wire rods, Nos. 4 and 5, P'gh.....	47.00	47.00	47.00	43.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	2.10	2.10	2.10	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	2.20
Bars, Chicago	2.50	2.50	2.50	2.25
Bars, Cleveland	2.50	2.50	2.50	2.25
Bars, New York	2.79	2.79	2.79	2.55
Plates, Pittsburgh	2.25	2.25	2.25	2.05
Plates, Chicago	2.30	2.30	2.30	2.10
Plates, New York	2.54	2.54	2.54	2.33
Structural shapes, P'gh	2.25	2.25	2.25	2.05
Structural shapes, Chicago..	2.30	2.30	2.30	2.10
Structural shapes, New York	2.5125	2.5125	2.5125	2.3025
Cold-finished bars, P'gh.....	2.90	2.90	2.90	2.55
Hot-rolled strips, P'gh.....	2.40	2.40	2.40	2.15
Cold-rolled strips, P'gh.....	3.20	3.20	3.20	2.85
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	2.80
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	2.90
Sheets, galv., No. 24, P'gh...	3.80	3.80	3.80	3.40
Sheets, galv., No. 24, Gary..	3.90	3.90	3.90	3.50
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	2.15
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	2.25
Cold-rolled sheets, No. 20, Pittsburgh	3.55	3.55	3.55	3.25
Cold-rolled sheets, No. 20, Gary	3.65	3.65	3.65	3.35
Wire nails, Pittsburgh	2.75	2.75	2.75	2.25
Wire nails, Chicago Dist. mill	2.80	2.80	2.80	2.30
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.65
Barbed wire, galv., P'gh....	3.40	3.40	3.40	2.75
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	2.80
Tin plate, 100 lb. box, P'gh.	\$5.35	\$5.35	\$5.35	\$4.85

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	Feb. 1, 1938	Jan. 25, 1938	Jan. 4, 1938	Feb. 2, 1937
No. 2 fdy., Philadelphia.....	\$25.84	\$25.84	\$25.84	\$22.76
No. 2, Valley furnace	24.00	24.00	24.00	21.00
No. 2, Southern Cln'ti	23.89	23.89	23.89	20.69
No. 2, Birmingham†	20.38	20.38	20.38	17.38
No. 2, foundry, Chicago*.....	24.00	24.00	24.00	21.00
Basic, del'd eastern Pa.....	25.26	25.26	25.26	22.26
Basic, Valley furnace	23.50	23.50	23.50	20.50
Malleable, Chicago*	24.00	24.00	24.00	21.00
Malleable, Valley	24.00	24.00	24.00	21.00
L. S. charcoal, Chicago.....	30.24	30.24	30.24	26.54
Ferromanganese, seab'd car-				
lots	102.50	102.50	102.50	80.00

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.
The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh....	\$14.25	\$14.25	\$14.25	\$19.25
Heavy melting steel, Phila....	14.75	14.75	14.75	18.50
Heavy melting steel, Ch'go....	13.00	13.00	13.00	19.00
Carwheels, Chicago	15.50	15.50	15.50	18.50
Carwheels, Philadelphia	15.75	16.25	16.25	18.50
No. 1 cast, Pittsburgh	16.25	16.25	16.25	17.75
No. 1 cast, Philadelphia....	16.25	16.75	16.75	19.25
No. 1 cast, Ch'go (net ton)....	12.50	12.50	12.50	16.00
No. 1 RR. wrot., Phila.....	15.75	16.25	16.25	17.25
No. 1 RR. wrot., Ch'go (net)	10.75	10.75	10.75	16.75

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	\$4.00	\$4.00	\$4.00	\$4.00
Foundry coke, prompt	5.00	5.00	5.00	4.50

Metals

Per Lb. to Large Buyers:	Cents	Cents	Jan. 3	Cents
Electrolytic copper, Conn....	10.00	10.25	10.125	13.00
Lake copper, New York.....	10.125	10.625	11.125	13.12 1/2
Tin (Straits), New York....	40.875	41.00	41.125	50.50
Zinc, East St. Louis.....	5.00	5.00	5.00	6.00
Zinc, New York	5.35	5.35	5.35	6.35
Lead, St. Louis.....	4.75	4.75	4.60	5.85
Lead, New York.....	4.90	4.90	4.75	6.00
Antimony (Asiatic), N. Y. ..	15.625	15.625	15.00	14.25

The Iron Age Composite Prices

Finished Steel

Jan. 25, 1938
One week ago
One month ago
One year ago

2.605c. a Lb.
2.605c.
2.605c.
2.330c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

	High	Low
1937.....	2.605c., Mar. 9;	2.330c., Mar. 2
1936.....	2.330c., Dec. 23;	2.084c., Mar. 10
1935.....	2.130c., Oct. 1;	2.124c., Jan. 8
1934.....	2.199c., Apr. 24;	2.008c., Jan. 2
1933.....	2.015c., Oct. 3;	1.867c., Apr. 18
1932.....	1.977c., Oct. 4;	1.926c., Feb. 2
1931.....	2.037c., Jan. 13;	1.945c., Dec. 29
1930.....	2.273c., Jan. 7;	2.018c., Dec. 9
1929.....	2.317c., Apr. 2;	2.273c., Oct. 29
1928.....	2.286c., Dec. 11;	2.217c., July 17
1927.....	2.402c., Jan. 4;	2.212c., Nov. 1

Pig Iron

\$23.25 a Gross Ton
23.25
23.25
20.25

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

	High	Low
\$23.25, Mar. 9;	\$20.25, Feb. 16	
19.73, Nov. 24;	18.73, Aug. 11	
18.84, Nov. 5;	17.33, May 14	
17.90, May 1;	16.90, Jan. 27	
16.90, Dec. 5;	13.56, Jan. 3	
14.81, Jan. 5;	13.56, Dec. 6	
15.90, Jan. 6;	14.79, Dec. 15	
18.21, Jan. 7;	15.90, Dec. 16	
18.71, May 14;	18.21, Dec. 17	
18.59, Nov. 27;	17.04, July 24	
19.71, Jan. 4;	17.54, Nov. 1	

Steel Scrap

\$14.00 a Gross Ton
14.00
14.00
18.92

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	High	Low
\$21.92, Mar. 30;	\$12.92, Nov. 16	
17.75, Dec. 21;	12.67, June 9	
13.42, Dec. 10;	10.33, Apr. 23	
13.00, Mar. 13;	9.50, Sept. 25	
12.25, Aug. 8;	6.75, Jan. 5	
8.50, Jan. 12;	6.43, July 5	
11.33, Jan. 16;	8.50, Dec. 29	
15.00, Feb. 18;	11.25, Dec. 9	
17.53, Jan. 29;	14.03, Dec. 2	
16.50, Dec. 31;	13.03, July 2	
15.25, Jan. 17;	13.03, Nov. 22	

....ST. LOUIS....

... **Missouri Pacific authorized to spend \$7,540,088, partly for rails and accessories.**

ST. LOUIS, Feb. 1.—The Federal Court at St. Louis has authorized the Missouri Pacific Railway to expend \$7,540,088 for improvements to roadbed and equipment during 1938, of which \$7,008,973 is for the parent company, and the remainder for these subsidiaries: Missouri Pacific in Nebraska, \$298,500; Chester & Mount Vernon, \$105,350; Cairo & Thebes, \$21,500; Natchez & Louisiana Railway Transfer, \$7500; New Orleans & Lower Coast, \$16,400, and Union Railroad, \$81,725.

The rail program includes the purchases of 22,053 tons of 112-lb. rails and 4250 tons of 90-lb. rails, a total of 26,303 tons of rails, and 525,300 rail anchors and 835,000 tie plates, for the Missouri Pacific; 1765 tons of 112-lb. rails, 65,000 tie plates and 33,600 rail anchors for the Missouri Pacific Corp. in Nebraska; 10,000 anchors for the Chester & Mount Vernon, and 8000 tie plates for the Cairo & Thebes.

Other principal items in the program are bridges, trestles and culverts, \$1,210,290; elimination of grade crossings, \$60,000; additional yard tracks, \$293,335; signals and interlocking equipment, \$272,650; telegraph and telephone lines, \$61,156; roadway machinery and tools, \$68,210; right of way snow and sand fences, \$43,600; fuel stations and appurtenances \$170,000; shop buildings and engine houses, \$217,775; shop machinery and tools, \$137,980; work equipment, \$160,200; improvements to existing equipment, \$758,690; and building of 100 50-ton capacity 40-foot flat cars, using some old material, at a net cost of \$182,950, and four baggage and express cars, using some old material, at a net cost of \$47,400.

Structural Steel

Structural awards include 900 tons for bridge repair work at St. Charles, Mo., to Fort Pitt Bridge Co.; 250 tons for a highway bridge at Moberly, Mo., to Bethlehem Steel Co.; 150 tons for a highway bridge at Booneville, Mo., to Reliance Steel Co. and 120 tons for a highway bridge in Monroe County, Ill., to Wendnagel & Co., Chicago. For the Missouri State Prison power house at Jefferson City, 250 tons of structural shapes and 100 tons of reinforcing bars will be required. The Missouri Rolling Mills was awarded

200 tons of reinforcing bars for the livestock pavilion at the Illinois State Fair grounds at Springfield. Pending projects include 20 barges for the Federal Barge Line at St. Louis, the tonnage being undetermined; 370 tons of steel sheet piling for the Board of Public Service, St. Louis, and 315 tons of sheets for the State of Missouri at Jefferson City.

Pig Iron

Shipments of pig iron during the week were ahead of the preceding week, and rush shipping directions indicated that stocks in hands of melters are low. But there is no new buying except for a carload or so for immediate shipment, usually to fill in.

Ingot operations in the St. Louis area are up to 25 per cent of capacity.

..BIRMINGHAM..

... **Iron and steel production holds firm.**

BIRMINGHAM, Feb. 1.—Iron and steel production continues with little fluctuation. Thirteen blast furnaces are operating for the third consecutive week, since Woodward Iron Co. still has all three of its stacks in production. One of these, though, is due to be taken off at an early date. Ten open hearths were worked last week; 11 are scheduled for this week. The increase is at Fairfield.

The outlook here for steel still seems to be somewhat better than elsewhere. Tennessee Coal, Iron & Railroad Co. operations remain around 70 per cent and are likely to continue at that point or above all the way through the first quarter. There is a fair run of small orders for sheets and wire products, and there seems to be a better trend toward consumer buying. Since the first of the year most of the tonnage was for the rebuilding of jobber and dealer stocks. A number of inquiries are out for bars, plates and shapes. Current bookings, however, are small.

Talk of steel prices is affecting the trade, so local steel officials state, and buyers seem to be holding off as much as possible, pending a clarification of the situation.

The pig iron market is moving slowly. Foundry melt is rather light. Foundries are either drawing heavily on stocks or ordering close to immediate needs. They are delaying as long as possible to specify against contracts and then ask for quick shipments. New business is also on the same basis. Contracting for the first quarter has been limited.

RAILROAD BUYING

Grand Trunk Western, a Canadian National Railway subsidiary, has ordered six streamline passenger engines from Lima Locomotive Works, Lima, Ohio.

Milwaukee Road may increase present 1000-car building program to 1500 cars.

Central Railways of Brazil have awarded 250 gondola and flat cars and 95 underframes to Pullman-Standard Car Mfg. Co.

San Francisco-Oakland Bay Bridge Commission, San Francisco, has received low bid of \$370,283 from Barrett & Hilp, San Francisco, for catenary and feeders of bridge railway facilities requiring switches, cables, and miscellaneous supplies.

American Car & Foundry Motors Co. has received the following orders for motor coaches: five for Rio Grande Motor Way, Denver; five for Citizens Rapid Transit Corp., Alexandria; three for Old Colony Coach Lines, Inc., Boston; three for Denver, Colorado, Springs & Pueblo Motor Way, Denver; two for Southern Kansas Greyhound Lines, Kansas City, and one for Safeway Trails, New York.

Missouri Pacific 1938 budget, as approved by the Federal Court, St. Louis, provides for retirement of 100 steel underframe 50-ton coal cars and material and new steel work for bodies and building of 100 50-ton flat cars, to cost \$182,950; retirement of four steel underframe coach and chair cars and use of old material and new steel to build four all-steel baggage and express cars, to cost \$47,400; 1 AAR transverse fissure, detector of defective rails not to be purchased unless proved a success, \$20,000. Improvements to existing equipment includes thermic syphons for 15 locomotives, \$29,100; feedwater heaters for 10 locomotives, \$38,000; cast steel cylinders for 10 locomotives, \$39,700; cast steel truck frames for 30 locomotive tenders, \$79,500; force feed lubricators for 50 locomotives, \$16,350; mufflers to blow off cocks on 75 locomotives, \$5,500; truck springs and snubbing device for 1900 freight cars, \$58,900; AB type air brake equipment for 750 freight cars, \$142,500; Alemite System grease lubrication for 100 locomotives, \$17,500; air conditioning equipment for five steel coaches, \$22,500. Program also includes building two 17,250-gal. water and 20-ton coal tenders, \$36,000; remodeling and decorating four dining cars, \$20,800, and an item of \$27,800 for contingencies in equipment work.

Missouri Pacific 1938 budget, as approved by St. Louis Federal Court, lists roadway machinery and tools totaling \$68,210, including two adzing machines, \$3,200; motor car replacements, \$10,900; one crawler drag line machine, \$8,000; one combined grinder and rail mill, \$800; three concrete mixers, \$5,000; five electric tamper outfits, \$15,500; 12 electric tamping units, \$4,360; four self-contained gasoline tamping tools, \$1,400; one compressor and spike driver, \$3,000; two self-contained gasoline concrete breakers, \$700; one metalizing unit, \$1,600; gasoline driven 2-stage 105-cu. ft. air compressor mounted on skids, \$2,000; one crawler tractor, \$4,500; one 1½-cu. yd. clam shell bucket, \$1,000; two 100-ton self-lowering jacks, \$550; one gasoline driven internal concrete vibrator, \$400; one McKiernan-Terry 9-b-3 steam pile hammers, \$1,900; one electric driven tool for framing lumber at creosoting plant, \$3,000; one portable electric light plant, \$500.

RAILS AND TRACK SUPPLIES

Missouri Pacific has been authorized to buy 22,053 tons of 112-lb. rails, 4250 tons of 90-lb. rails, 535 rail anchors and 835,000 tie plates for its own tracks; 1765 tons of 112-lb. rails, 65,000 tie plates and 33,600 rail anchors for Missouri Pacific Corp. in Nebraska; 10,000 rail anchors for Chester & Mount Vernon, and 8000 tie plates for Cairo & Thebes. The court has also authorized the expenditure of \$899,100, including 2250 tons of 90-lb. rails for the New Orleans, Texas & Mexico, and \$770,550 for International-Great Northern, to include 3000 tons of 90-lb. rails, all subsidiaries of the Missouri Pacific.

... CHICAGO ...

... Operating rate declines two points.

• • •

... Buyers showing extreme caution.

• • •

... Consumers oppose price reductions.

CHICAGO, Feb. 1.—The trend of operations here this week is rather confused. While an increase has been reported by one mill, two other producers are showing losses, the rate for the district resulting in a net decrease of two points to 25 per cent of capacity.

Lacking the stimulus of recent rail orders, today's market is unimpressive and is unusual only in that demand for plates, shapes and bars is running ahead of that for sheets and strip. Sales and specifications are reported just a little less than last week.

Buyers continue to exercise the same close control over inventories as was apparent prior to the first of the year. A survey of a well diversified list of customers by one producer here showed almost a unanimous expression of opposition to reductions in steel prices at the present time. Blame for the continuation of hand-to-mouth purchasing was laid to over-caution and the ability to secure orders promptly at any time, with emphasis on the last.

Illustrative of the emptiness of some mills is the report yesterday in the *Gary Post-Tribune* of a British order for sheets received after the sheet mill cold reduction employees had been notified there would be no work all this week. The order, which is understood to total over 2000 tons, will provide one or two days work in the cold reduction department of the sheet mill for more than 1000 employees, who otherwise would have been idle. This occurrence is a repetition of the events of the week of Jan. 5 when a Russian order afforded work when the mill otherwise would have been closed.

These instances, more than anything else, show exactly how little support is being given steel producers by the automobile industry at the moment, which is the largest single consumer of cold rolled sheets.

Concrete evidence of a slump in the activities of the farm equipment manufacturers is now at hand. A steel company which sells largely to that industry reports this week a 14 per cent drop in operations, indicating that further reductions may be necessary over the next few weeks if increased orders are not secured. Foundries casting for implement makers are currently showing declines. This industry, however, is still operating at a far higher rate than other consumers of steel products.

Some additional railroad activity may be seen here soon as the Milwaukee is understood to be contemplating increasing by 500 its 1000-car program, which is already under way. A Brazilian carrier placed 250 gondolas and flat cars and 95 underframes with Pullman-Standard Car Mfg. Co.

Construction is getting underway on the new zinc rolling mill of the Illinois Zinc Co. to be located here. Completion is expected by May 1.

Pig Iron

January shipments, according to one seller, were about 5 per cent better than those of December, whereas an increase of about 14 per cent had been predicted. Activity in foundry coke is slightly higher. A betterment in general jobbing foundry conditions has been almost entirely offset by declines in agricultural machinery foundries.

Structural Shapes and Reinforcing Steel

Although demand for shapes and plates has outpaced that for the lighter finished steel production lately, there still seem to be very few important projects underway. The Hennepin, Ill., bridge has gone to Bethlehem. Wisconsin Bridge & Iron Co. was awarded the Sag Channel bridge in

Cook County, Ill., thus accounting for the major jobs here. Reinforcing bars are quiet, an inquiry for 4500 tons for a Texas dam being the only outstanding work in contemplation.

Bars

Only a scattered demand for bars exists at the moment from steel consumers in this area, and chief among these are the makers of tractors and farm implements. Very few orders are being received from automobile sources and no improvement in this type of business has been noticed.

Sheets and Strip

With the motor car industry evincing so little interest just now, demand for the heavier steel products has been greater for the past few weeks than that for sheets and strip. Cold rolled sheet deliveries are being quoted two to three weeks, while galvanized sheets may be had in three weeks. Strip shipments are practically prompt.

Plates

Of interest here is the report that the Milwaukee Road's contemplated 1000-car construction program announced several weeks ago may be increased 500 cars. The Missouri Pacific has secured court authorization to expend funds for equipment. (Details in St. Louis market report.) Pullman-Standard has been awarded 250 gondolas and flat cars and 95 underframes by the Central Railways of Brazil. Increased specifications for plates for structural purposes have been reported.

Wire and Wire Products

Stocks generally are low, but buyers continue to follow conservative purchasing policies. Reluctance to buy ahead is attributed to caution and lack of necessity, since deliveries are so prompt, rather than to any expectation of lower prices, according to a leading interest here which has made a field survey of consumers' attitudes. A growing demand from jobbers in rural regions has not yet been noticed, but wire sellers continue to predict a good reception for their products in this market when the fields and farms open up after the winter.

....BUFFALO....

... Only six open hearths active in district

BUFFALO, Feb. 3.—Operations have sagged till there are only six open hearths active in the district. Republic Steel corp. is down and will not resume before the week of Feb. 7 at the earliest. Bethlehem's Lackawanna plant has cut its active furnaces to five while Wickwire-Spencer continues to operate one.

Seven blast furnaces are blowing: three at Bethlehem, two at Hanna Furnace Corp., one at Republic and one at Tonawanda Iron Corp.

General contract for the additional buildings at Auburn Prison, Auburn, N. Y., has gone to a Buffalo contractor, C. F. Haglin & Co., who have not yet placed the order for 600 tons of structural steel and 120 tons of bars involved in the undertaking. In the bar bidding, the Schuster system is optional.

Disposition of the steel contracts involved in the erection of a highway bridge at Cheektowaga waits on a formal signing of a contract with the general contractor, Metzger Construction Co., Buffalo.

Warehouse prices are stable, but demand is slack.

....PIPE LINES....

Channel Gas Corp., Second National Bank Building, Houston, Tex., Claud Hamill and R. E. Smith, heads, plans welded steel pipe line from Bammel gas field, near city, to be developed for natural gas supply, to industrial district at Houston, about 20 miles, for gas transmission for a number of industrial plants. Cost over \$100,000.

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 11 for 99,000 ft. of galvanized welded steel pipe and 4000 ft. of welded steel pipe (Schedule 3329).

Bay Pipe Line Corp., 205 Bearinger Building, Saginaw, Mich., affiliated with Bay Refinery Corp., same address, has begun work on 6-in. welded steel pipe line from Buckeye Township oil field, Gladwin County, Mich., to Saginaw River waterfront at Bay City, Mich., about 35 miles, for crude oil transmission for refinery of last noted company, now in course of construction. James C. Graves is vice-president.

Oklahoma Pipe Line Co., National Bank of Tulsa Building, Tulsa, Okla., has authorized 4-in. welded steel pipe line from Stillwater, Okla., to new oil field district now being developed near that place, for crude oil transmission.

Lower Colorado River Authority, Littlefield Building, Austin, Tex., closes bids Feb. 7 for three 16-ft. dia. steel plate penstocks for Marshall Ford dam, Colorado River.

Shell Pipe Line Corp., Shell Building, St. Louis, will expend about \$5,000,000 for extensions in welded steel pipe lines, instead

of smaller sum noted in these columns last week, comprising 8 and 6-in. lines from Indianapolis to Toledo, Ohio, by way of Lima, Ohio, about 220 miles, and 6-in. line from Lima to Columbus, Ohio, 67 miles, for gas-line transmission. New line will connect with present 241-mile, 8-in. welded steel pipe line from refinery of Shell Petroleum Corp., parent organization, at Wood River, Ill., to Indianapolis.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., closes bids Feb. 10 for steel pipe liners for regulating conduits at Hiwassee dam.

Gas Engineering Co., Des Moines, Iowa, plans steel pipe line system for gas distribution at Cresco, Iowa, including gas plant.

Metropolitan Water District, Los Angeles, has awarded 5010 ft. of 22-in. i.d. 14-gal. pipe to American Pipe & Steel Corp., Los Angeles.

San Bernardino, Cal., Board of Water Commissioners has opened bids on 9400 ft. of 12-in. i.d. pipe for water system.

Cleveland has awarded 600 tons of 36-in. steel pipe to Ohio Corrugated Culvert Co., Cleveland, for a line from the Parma Reservoir.

..CAST IRON PIPE..

Neptune Beach, Fla., has plans for 30,210 ft. of 2, 3, 6 and 8-in. pipe for water system; also 100,000-gal. elevated steel tank on 110-ft. steel tower, two motor-driven pumping units and two diesel engine-driven pumps and other waterworks installation. Cost about \$91,200. J. L. Burke is town engineer.

Elwood, Kan., has called special election Feb. 11 to approve bonds for \$26,000 for water pipe line and other waterworks installation, including steel standpipe. Cost about \$46,000, remainder of fund to be secured through Federal aid. Paulette & Wilson, 1006 Kansas Avenue, Topeka, Kan., and Farmers' Union Building, Salina, Kan., are consulting engineers.

Hoosick Falls, N. Y., plans extensions in water pipe lines, including trunk line for additional water main and other waterworks installation. Cost about \$120,000. Financing will be arranged soon. Solomon & Keis, 257 Broadway, Troy, N. Y., are consulting engineers.

North Tonawanda, N. Y., plans pipe lines for extensions in water system to new residential area of city. Financing is being arranged through Federal aid. C. L. Oelkers is city engineer.

Greenville, S. C., plans 16-in. pipe line for extensions in trunk water line from McBee Avenue to Pendleton Street. Cost about \$48,000. Financing is being arranged through Federal aid.

General Purchasing Officer, Panama Canal, Washington, closes bids Feb. 8 for 4600 ft. of cast iron soil pipe and cast iron soil pipe fittings (Schedule 3327).

Central Board of Purchases, City Hall, Milwaukee, asks bids until Feb. 17 on 1700 tons of 6 to 16-in. class C for water system; also for about 101 tons of special castings, 47 tons of offset pipe, two and one-half tons of reducing branches, including 500 valve boxes and 900 parts, 330 gate valves, 30 tapping valves, two tons of tapping sleeves and 250 fire hydrants (C. P. No. 6).

Orfordville, Wis., has low bid from Wisconsin Foundry & Machine Co., Madison, Wis., for 200 tons of 6 to 12-in. water pipe.

Seagraves, Tex., plans extensions in water pipe lines. Bond issue of \$100,000 has been

approved for this and extensions in sewerage system.

Cleveland, Tex., plans pipe lines for extensions and replacements in water system recently acquired from Gulf States Utilities Co., to be operated as municipal property in future. Fund of \$180,000 has been arranged for acquisition and expansion in lines and other waterworks facilities.

La Mesa, Lemon Grove & Spring Valley Irrigation District, La Mesa, Cal., has purchased 1080 tons of 4, 6, 8 and 12-in. pipe for unit 2 of its distribution pipe line replacement project from U. S. Pipe & Foundry Co., San Francisco.

United States Treasury Procurement Office, San Francisco, has awarded 140 tons of pipe to the U. S. Pipe & Foundry Co., San Francisco. This company is low bidder on an additional 190 tons for same agency.

Junction City, Ore., has awarded 153 tons of 4, 6 and 8-in. pipe and fittings to Pacific Water Works Supply Co., Seattle.

FINANCIAL NOTES

Rustless Iron & Steel Corp. reports for 1937 a net profit of \$713,123 equal, after dividends on \$2.50 preferred stock, to 77c. a share on common. This compares with net profit in 1936 of \$350,707 or 43c. a common share.

National Steel Corp. reports preliminary net earnings for 1937, after all charges, including interest, taxes, depreciation and depletion, but before provision for the undistributed profits tax, of \$19,516,892.67, equal to \$9.00 per share on 2,167,877 shares of outstanding capital stock. This compares with \$13,171,148.80 or \$6.09 per share earned before undistributed profits tax in 1936. For the final quarter of 1937, earnings before undistributed profits tax amounted to \$2,580,925.51 or \$1.19 per share, comparing with \$4,628,729.44 or \$2.14 per share in the corresponding quarter of 1936. This also compares with earnings in the third quarter of 1937 of \$5,227,071.04 or \$2.41 per share.

Otis Steel Co., Cleveland, at a meeting Jan. 28, declared the regular dividend of \$1.37½ per share on the company's convertible first preferred stock, payable March 15, 1938, to stockholders of record March 1, 1938.

Inland Steel Co. reported for the year ended Dec. 31, 1937, a net profit of \$12,665,317 after interest, depreciation and all taxes, equal to \$8.05 a share on 1,573,950 shares of common stock. This compares with net profit in 1936 of \$12,800,545, or \$8.54 a share. Net profit of \$867,571 was reported for the fourth quarter of 1937.

United Engineering & Foundry Co. declared the regular quarterly dividend of 50c. on common stock and \$1.75 on preferred, both payable Feb. 15 to record Feb. 5.

Jones & Laughlin Steel Corp.'s regular meeting of the board of directors, scheduled for last week, has been postponed until Feb. 25.

Wickwire-Spencer Cuts Wages 20%

THE Wickwire-Spencer Steel Co., New York, has announced a reduction of 20 per cent in salaries and wages, effective at once. While Wickwire-Spencer is not the first to cut salaries, it is the first steel company, so far as reported, to cut wages.

. . . CLEVELAND . . .

... Operations low in the Ohio districts.

. . .

... Orders small and for immediate needs.

. . .

... Steel scrap declines 50c a ton.

CLEVELAND, Feb. 1.—Fewer open-hearth furnaces are in production this week in both the Cleveland-Lorain and Youngstown districts, the ingot rate in the former district being off four points to 26 per cent because of a curtailment at one plant, while Youngstown is down five points to 26 per cent owing to slightly lower schedules at all plants except one, which is holding even with last week.

The fluctuations in average output from week to week are merely in line with present business conditions and are usually expected in times like these. Actually during the last few weeks very little change has occurred in the average rate of business coming to the mills. Gains recorded in a few products have been offset by declines in other lines, and while one producer reports the past week better than any of the preceding eight, the same situation does not hold true with other sellers. Orders are being received from a wide range of consuming industries but are individually small and strictly for current requirements.

As a whole, the volume of January business was disappointing to producers, although modest gains were made over the preceding month in orders for most products.

A temporary drop in specifications followed the statement from Washington on wages and prices, steel makers holding that the announcement served to emphasize the problem in the minds of consumers and added to their perplexity over the outlook for the immediate future. Since the holidays, the steel mill wage question has become increasingly a factor in the hesitancy of consumers to make commitments. Clarification is expected this month, but the possible effect upon orders is obscure now.

Under a revision in the quantity differential on 26, 28 and 29 gage galvanized roofing in carload quantities,

producers will allow \$1 more per ton to jobbers, fabricators and consumers.

Banking of a blast furnace today at Lorain has further reduced pig iron output in this area, following the shutdown of a Cleveland furnace 10 days ago.

No. 1 heavy melting scrap steel is down 50c. per ton to a range of \$12 to \$12.50 as a result of the prolonged period of inactivity.

Pig Iron

Production continues light, in line with the reduced volume of demand encountered during the last few months. Numerous foundries in this district which are dependent on the automotive industry are operating on irregular schedules and confining their orders to actual needs.

Sheets and Strip

Largely due to miscellaneous consumption, which has shown a better proportionate revival than the automotive industry, new business in sheets and strip has been maintained at a steady though light rate since the middle of January. The aggregate volume of orders is greatly reduced from one year ago. Automotive buying consists of only small occasional orders, considerably under normal requirements from this industry. An increase of \$1 a ton in the quantity differential allowance on 26, 28 and 29 gage galvanized roofing in carload quantities has been announced by some producers and others are expecting to follow suit. The revision, from 15c. to 20c., applies to jobbers, consumers and fabricators of the three gages.

Wire and Wire Products

Very little change has been noted in the rate of incoming business for merchants' and manufacturers' wire, the volume of bookings being slightly improved over December but greatly reduced from one year ago. Mer-

chants' products continue to be relatively more improved than manufacturers'. Prices in the primary market are reported holding well despite occasional weaknesses which have cropped up in the secondary markets in certain products such as nails. Most consumers are hesitant to order more than what is absolutely necessary at this time.

Warehouse Business

Movement from warehouses continues light, but improved in comparison with the latter part of December. Demand consists largely of orders for miscellaneous plant repair work and a few specifications diverted from mills because of the inability to obtain prompt rollings, in view of the small size of the orders. The amount of business in the latter classification is not nearly as large as might be expected, according to warehouse executives.

Tubular Goods

The steel pipe markets remain dull, with standard and line pipe quiet, due to seasonal inactivity. Demand from the oil country is fairly well maintained. Ohio Corrugated Culvert Co., Cleveland, has been awarded 600 tons by the city of Cleveland, for its line from the Parma Reservoir.

Bars, Plates and Shapes

New business in bars, plates and shapes is at practically the same rate as last week. Inactivity on the part of most of the railroads is felt keenly. During the past week the Chesapeake & Ohio has made some more allocations, distributing its tie plates and spikes among numerous producers, but the buying by this carrier is an exception. Structural awards or inquiries involving large tonnages are very scarce. Among the recent awards are 275 tons for the Cuyahoga Heights school placed with Kilroy Structural Steel Co., Cleveland, and 212 tons for the East Market Street bridge in Akron placed with Bethlehem Steel Co. The State of Ohio will take bids Feb. 8 for a bridge in Hamilton County, including 420 tons of shapes and plates and 180 tons of reinforcing bars. New billet reinforcing bar prices are reported holding up fairly well, but there are occasional variations in the rail steel market.

...CINCINNATI...

...New business and operations better in southern Ohio.

CINCINNATI, Feb. 1.—New business the past week was slightly above that of the preceding period. Automotive ordering was better, and some pickup in miscellaneous demand was noted. Buying by jobbers is also more active. Interest in galvanized sheets is most noticeable because of its presence so early in the season. Mill operations are up a few points to near 40 per cent as manufacturers seek to keep abreast of demand.

Production of ingots is more active, 16 open hearths out of 34 in the district being in operation. Mill interests report that most of the raw steel is being used and inventories are not being materially increased.

The pig iron market is quiet. Shipments the past week eased a trifle. Foundries are operating two to three days a week.

Coke prices have been reaffirmed for February at \$10.50 a ton, delivered Cincinnati.

...SAN FRANCISCO...

...Grand Coulee Dam Job Awarded to Interior Construction Co.

SAN FRANCISCO, Jan. 31.—The Bureau of Reclamation has awarded the contract for completion of Grand Coulee Dam, left power house, and foundation for the pumping plant to Interior Construction Co., Oakland, Cal., a combination of eight major construction companies and low bidder at \$34,442,240. This sets at rest rumors that the work might be undertaken by the Government. The necessary steel is being purchased by the Bureau of Reclamation, direct, as needed.

Awards of 850 tons of shapes for completion of the Owens-Illinois Pacific (Glass) Co. plant at Oakland, Cal., to Moore Dry Dock Co. of that city, and of 565 tons of shapes for the Seattle armory to Isaacson Iron Works, Seattle, dominated the structural steel field. New projects were few.

The first reinforcing bar award in connection with the Grand Coulee completion, 1680 tons, went to Columbia Steel Co., Denver. Bethlehem Steel Co., Seattle, took 1050 tons for

the Seattle armory and 290 tons for the Washington State custodial school at Olympia.

The bid by Barrett & Hilp, San Francisco, of \$370,283, for catenary and feeders of the San Francisco-Oakland Bay Bridge railway facilities has been taken under advisement. The work will require a large quantity of switches, cables, and miscellaneous electrical supplies.

La Mesa, Lemon Grove and Spring Valley Irrigation District, La Mesa, Cal., has purchased 1080 tons of cast iron pipe for completion of its distribution pipeline replacement project from the U. S. Pipe & Foundry Co., San Francisco.

...GREAT BRITAIN...

...Conditions are easier in European steel markets.

LONDON, Feb. 1. (By Cable).—Iron and steel bookings in January were less than in December mainly owing to the reluctance of buyers and sellers to increase commitments while order books are congested, but the non-revival of export demand is causing apprehension in some quarters.

Home pig iron prices have been stabilized until the end of June, and few orders have been placed beyond then. Home steel prices will hold until the end of the year, but, as world prices are sagging, doubts are expressed whether United Kingdom prices can be maintained for the whole year.

Continental steel is still quiet and the outlook is far from favorable, though there is a large potential demand. Reduction of prices did not stimulate buyers into real activity. Further reductions in prices at present considered unlikely.

The tin plate market is quiet and there is virtually no export booking for shipment beyond March. Unfilled orders are a trifle under 4,000,000 base boxes. Output is 60 per cent and may go lower. The outcome of the Tin Plate Cartel meeting in Paris on Thursday is awaited with much interest.

Black sheets are quiet, and the demand for galvanized sheets is still poor despite the recent price reduction.

Australia is to import 25,000 tons of British sheets free of the general 15 per cent ad valorem duty owing to the strike at the Lysaghts Australian mills.

CANADA

...Steel business increasing in the Dominion.

TORONTO, Feb. 1.—Annual reports by various companies associated with the iron and steel industry reveal figures showing production and earnings for 1937 at the highest level since 1930, and also state that backlogs carried into 1938 assure high operating schedules for several months. The agricultural implement branch experienced a decidedly favorable year, both on domestic consumption account and export, the latter business showing almost double that of the preceding year. The automotive industry also had a good year.

Prospective business is increasing and Canadian steel interests look for substantial orders for railroad equipment, structural steel, sheets, bars and various other materials. Already fairly heavy booking has been done for first quarter. Spot buying is increasing steadily and various plant operations are on a par with the high records made last year.

Demand for merchant pig iron is gaining, while production is sustained at the former level, with six furnaces blowing. December output totaled 81,032 gross tons, approximately 400 tons under November's total, while for the year production jumped 32 per cent above 1936 to 897,855 gross tons, with monthly average of 75,000 tons, of which Nova Scotia produced monthly average of 27,000 tons and Ontario 48,000 tons. Current merchant pig iron sales are running around 2000 tons a week.

Structural Shipments Decline 21,760 Tons

SHIPMENTS of structural steel in December, 1937, were 108,396 tons, a drop of 21,760 tons from November, 1937, and the fourth consecutive monthly decline from the year's highest monthly total of 166,095 tons in August, according to the American Institute of Steel Construction. The total for the year was 1,660,570 tons, an increase of 112,365 tons over 1936.

Bookings in December, 1937, totaled 99,070 tons, as compared with 132,835 tons in November, 1937, and 166,542 tons in December, 1936. Bookings in the 12-month period aggregated 1,628,641 tons, or slightly more than 1 per cent above the 1936 total of 1,609,016 tons.

...NEW YORK...

... **Steel business small and irregular.**

o o o

... **Buyers await action on wages and prices.**

o o o

... **Brooklyn jobber bids below mills on sheets.**

NEW YORK, Feb. 1.—Steel business in this district is following an irregular course, some companies experiencing a rise in sales one week followed by a drop the next week. Many consumers admit that their stocks of steel are low, but they are buying from hand-to-mouth, in many instances from jobbers rather than from mills, rather than increase their inventories beyond what is actually need for work in hand. It would not be correct to say that there is any real pressure for price reductions, since so few buyers have tonnage to offer that would be tempting to the mills, but there is a widespread disposition to await the outcome of the wage negotiations between the United States Steel Corp. and the Steel Workers Organizing Committee.

There have been some releases of tin plate, which may afford a little better production in that product during the next few weeks. Demand for structural steel has improved somewhat.

The New York Tunnel Authority is taking bids on 4500 tons of shapes and 450 tons of reinforcing bars for the Queens land section of the Queens-Manhattan vehicular tunnel. Bids for a similar amount of steel for the Manhattan land section of the tunnel probably will be advertised within the next two or three weeks.

The \$100,000,000 housing bill now before the New York Legislature will, if passed, have very little direct effect on steel consumption as the bill calls for annual rentals under \$500 per dwelling. Rentals at this figure will necessitate the construction of small, wood frame houses.

Pig Iron

A small increase in the volume of sales has been experienced by sellers in this district due to the fact that many foundries are approaching the end of stocks built up last summer and are entering the market for small lots

to balance the analyses of existing yard piles. As melting operations have not shown any improvement and stocks on hand are generally sufficient to carry well through February at the present rate of consumption, it is unlikely that any sizable buying will develop before March. Out of the heavy volume of export inquiry that has been quoted on during the past two weeks, only a few scattered lots have been placed.

Reinforcing Bars

Public construction continues to account for the bulk of new activity, with 450 tons required for the Queens-Manhattan vehicular tunnel, 650 tons for a section of the Bronx-White-stone bridge and bids on 300 tons of miscellaneous lots for WPA requirements were to be opened by the Treasury Department this week. Small-lot buyers continue to purchase only sufficient material to cover their immediate needs. Low bid on a Boston project was \$53.40 per ton, delivered.

Plates and Sheets

Plates sales have yet to show any real signs of recovery from the late December low point, although there was a slight flurry of hold-over orders in early January. Neither locomotive nor car builders are in the market at the present time. Refinery equipment builders have not been the factors in the market they were last summer, but there is promise for business here in the near future. Shipbuilding is another potential source of orders.

Sheet business is more active. During the last few days, a number of carload lot orders have been received through jobbers for direct shipment to manufacturers, the first of this type of sale to be made in months. One local sales office reported a January volume of sheet orders equal to 35 to 40 per cent of normal, as compared with 20 per cent in December. Depletion of stocks accounts for almost all of the present volume.

Warehouse stocks are still high, but one jobber reported larger sales in January of this year than in 1937.

Panama Canal is now actively buying galvanized roofing sheets, both plain and corrugated. A contract for 317,600 lb. of corrugated was awarded recently to Sheet Metal Mfg. Co., of Brooklyn, at a price of \$6.20 per 100 lb. f.o.b. Most steel suppliers had quoted around \$6.51. On Feb. 2, bids were to be opened on approximately 1,000,000 lb. of corrugated, and on the 15th bids will be taken on 96,000 lb. of flat galvanized.

The State of New York has awarded a second contract for license plate material, this time to Bethlehem Steel Co., calling for 488 tons of No. 14 gage hot rolled pickled annealed steam blued sheets. Price is said to be \$4.14 delivered to Auburn Prison, compared with \$3.84 on the first lot of equal tonnage awarded to Eggleston Brothers & Co.

U. S. Steel Subsidiaries Offer Welding Booklet

Primarily concerned with methods of showing welding on drawings by the American Welding Society's new symbol system, an attractively bound 81-page booklet entitled "Welding Instructions and Standards—Part I" has just been published by the United States Steel Corp. subsidiaries. This brochure, first of a series discusses symbols for fusion and resistance welding, specifications for individual welds, and various types of welded joints. Copies may be obtained from United States Steel Corp. subsidiaries, Box 176, 434 Fifth Avenue, Pittsburgh, or at district offices of Carnegie-Illinois Steel Corp.

Crane Co. Issues Valve Control Film

How valves and fittings give mankind control over liquids and gases is revealed in a sound picture entitled "Flow" just released by Crane Co., Chicago. Scenes of flood, thundering waterfalls and primitive means of controlling flow are followed in the picture by a tour through the Chicago works of Crane Co., where steps in manufacturing with iron, brass and steel are revealed. It shows valves varying in size from towering giants to the small faucets used in homes.

.. PHILADELPHIA ..

... District operations unchanged at 29 per cent.

o o o

... Brooke furnace to blow out on Monday.

o o o

... Very little ingot stocking in this area.

PHILADELPHIA, Feb. 1.—Contrary to reports of conditions in other sections of the country, a close check-up of mills in this territory has failed to uncover any ingot stocking of any moment whatsoever at the present rate of open-hearth operation. But, on the other hand, order books are improving at such a very slow pace that there seems little likelihood of the district rate moving upward other than a few points over the next three weeks or so. All mills here are operating at a pace practically unchanged from that of a week ago, and thus the average rate for eastern Pennsylvania continues at 29 per cent of theoretical capacity. Pencoyd is still living off of an ingot supply and has no furnace in operation; Lukens has three basic and one acid unit on; Central is running two furnaces; Alan Wood has three on at the moment, but one is an overlapping unit which will be taken off within a day or so; and Worth continues to operate one furnace.

Most sellers insist that current orders are more diverse than those of a month ago, and from the nature of the commitments it seems that many consumers have either very small or very spotty inventories. But no seller sees anything in the present situation to encourage any buying other than fill-in lots for prompt delivery, and this attitude is, if anything, exaggerated by all the current talk about the improbability of price decreases.

According to the Philadelphia Federal Reserve Bank, industrial activity in this territory was at the lowest level since 1935 at the turn of the year. This recession, however, has leveled off and appears to be showing some improvement at the moment.

Pig Iron

The last active merchant stack in the East will go out of blast on Mon-

day when E. & G. Brooke Iron Co. blows out its 400-ton-per-day furnace at Birdsboro. Although there has been some stocks built up at furnaces, the aggregate for the district is far from excessive. Consumer demands are currently very slack, and deliveries for January probably ran a little under the total for December. Foundry activity here is now averaging about three days a week, with jobbing units suffering the most from the recession. Yard stocks now can hardly last melters for more than four to six weeks. A fair volume of foreign iron continues to come into this port.

Sheets and Strip

Automobile releases are still held up, with the result that autobody stamping plants in this district are neither interested in new commitments nor taking all the steel already on order. Little alteration in this situation is expected for at least several weeks. Deliveries in January were better than the December total, but turnover is still far under the normal consumption of this area. Recent talk about the stability of prices has made both large and small buyers additionally cautious.

Plates and Shapes

A large volume of ship tonnage is pending here and additional ship awards to yards in this district are expected momentarily. Otherwise the plate market is listless. Bethlehem will soon start rolling shapes on the 6000-ton Rockefeller Center order secured recently, but fabrication of the armor plate required for battleships now building and those to be built will be spread over several years. The only sustained support to the shapes market locally comes entirely from continued State lettings for institutional work, and reports that Sun Oil Co. and du Pont will come into the market for sizable tonnages for additional

construction seems to have little foundation in fact. During the week, Reading Steel Products Co. secured 175 tons of shapes for a teachers college building at Shippensburg, Pa. The largest private job up for estimation here for some months calls for 2000 tons, for warehouses in Philadelphia for Lit Brothers. Other projects total 1550 tons, split up about equally among five institution buildings throughout eastern Pennsylvania and due for letting within the week. Reinforcing steel shows little activity, with awards for the week aggregating 500 tons, for Westchester and Manchester, Pa., teachers college buildings. New projects include 300 tons for a Norristown hospital and 1500 tons for warehouses for Lit Brothers in Philadelphia.

Imports

The following iron and steel imports were received here during the past week: 1272 tons of pig iron from British India; 4950 tons of chrome ore from South Africa; 6356 tons of chrome ore from the Philippine Islands; 36 tons of steel bands from Belgium; 13 tons of steel tubes, 8 tons of steel forging and 13 tons of steel bars from Sweden.

...BOSTON...

... Pig iron buying declines; foundry prospects poor.

BOSTON, Feb. 1.—Pig iron buying has fallen off and the New England melt has shrunk somewhat. Current pig iron sales are confined to a carlot now and then, the weekly aggregate amounting to but a few hundred tons. Manufacturers who intimated to foundries that orders for castings would be placed before long now say the chances for doing so are slim. Stocks of the largest consumers will carry further unless business improves. Stove manufacturers, who expected orders for spring delivery, say little if any business has developed. One central Massachusetts stove maker, busy all through the first depression, is closed, and others in the eastern part of the state are melting almost nothing.

An inquiry for 1500 tons of steel for a Massachusetts General Hospital unit is out for bids.

...NON-FERROUS...

... Copper quotations lowered to 10c.

o o o

... Zinc sales improve slightly; shipments decline.

o o o

... January tin deliveries rise 530 tons.

NEW YORK, Feb. 1.—Buying of non-ferrous metals has been light all week as consumers continue to exercise extreme caution in making purchases and covering only their immediate needs. On Friday custom smelters lowered electrolytic copper quotations to 10c. per lb., Connecticut Valley, and were promptly followed by primary producers. The action of the producers in dropping

quotations from 10.50c. to 10c. ended the split market price situation that has existed for the past several months. The last time prices were at 10c. consumers bought substantially and ceased buying as soon as prices were advanced. Consequently there is much interest in whether the newly established 10c. base will again bring out buyers. Sales over the week-end were 974 tons, slightly better than the

volume before the new price was established, but still far below the tonnage sold on the previous 10c. price. Today's export price of 9.90c. per lb., c.i.f., usual base ports, is unchanged from the price of a week ago. Export sales in January were 68,000 tons against 83,000 tons in December.

Zinc

Sales of prime Western for the week, amounting to 1613 tons, were double the previous week's sales. Deliveries, however, were 450 tons lower, the week's total of 2120 tons bringing undelivered stocks down to 41,663 tons. Quotations were unchanged all week at 5.35c. per lb., New York, with new business limited entirely to scattered carlots for prompt delivery. Prices abroad rose slightly during the week in a quiet market. On first call this morning spelter was quoted at 3.27c. per lb. for prompt delivery, an advance of three points over the price of a week ago.

The Week's Prices. Cents Per Pound for Early Delivery

	Jan. 26	Jan. 27	Jan. 28	Jan. 29	Jan. 31	Feb. 1
Electrolytic copper, Conn.*	10.25	10.25	10.00	10.00	10.00	10.00
Lake copper, N. Y.	10.625	10.625	10.125	10.125	10.125	10.125
Straits tin, spot, New York	40.75	40.375	40.25		40.50	40.875
Zinc, East St. Louis	5.00	5.00	5.00	5.00	5.00	5.00
Zinc, New York	5.35	5.35	5.35	5.35	5.35	5.35
Lead, St. Louis	4.75	4.75	4.75	4.75	4.75	4.75
Lead, New York	4.90	4.90	4.90	4.90	4.90	4.90

*Delivered Connecticut Valley; price 1/4c. lower delivered in New York.
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 15.625c. a lb., prompt, f.o.b., New York.
Antimony, American, 13.75c. per lb., prompt shipment, New York.
Quicksilver, \$78.00 to \$81.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 10.25c. a lb., less carload, delivered in Middle West
1/4c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	41.75c. to 42.75c.
Tin, bar	43.75c. to 44.75c.
Copper, Lake	11.00c. to 12.00c.
Copper, electrolytic	11.00c. to 12.00c.
Copper, castings	10.50c. to 10.75c.
*Copper sheets, hot-rolled	18.125c.
*High brass sheets	16.625c.
*Seamless brass tubes	19.375c.
*Seamless copper tubes	18.625c.
*Brass rods	12.625c.
Zinc, slabs	6.50c. to 7.50c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	11.50c.
Lead, American pig	6.00c. to 7.00c.
Lead, bar	7.125c. to 8.125c.
Lead, sheets, cut	8.50c.
Antimony, Asiatic	16.00c. to 17.00c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelt-ing, 98 to 99 per cent	19.50c. to 21.00c.
Solder, 1/2 and 1/2	29.00c. to 31.00c.
Babbitt metal, commercial grade	20.00c. to 50.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	44.75c.
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Tin, bar	46.75c.
Copper, Lake	11.00c. to 11.25c.
Copper, electrolytic	11.00c. to 11.25c.
Copper, castings	10.75c.
Zinc, slabs	7.25c. to 7.50c.
Lead, American pig	5.40c. to 5.65c.
Lead, bar	8.90c.
Antimony, Asiatic	18.50c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, high grade	48.75c.
Solder, 1/2 and 1/2	26.00c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.75c.	8.50c.
Copper, hvy. and wire	7.125c.	7.625c.
Copper, light and bottoms	6.25c.	6.50c.
Brass, heavy	4.50c.	5.125c.
Brass, light	3.625c.	4.375c.
Hvy. machine composition	6.625c.	7.125c.
No. 1 yel. brass turnings	4.625c.	5.125c.
No. 1 red brass or compos. turnings	6.375c.	6.875c.
Lead, heavy	4.00c.	4.375c.
Cast aluminum	9.875c.	11.00c.
Sheet aluminum	11.50c.	13.00c.
Zinc	2.875c.	3.125c.

Lead

Buying last week was on the smallest scale experienced in some time. The weakness in copper prices has accentuated the cautiousness of consumers who are limiting their purchases to metal required for immediate operations. Quotations remained unchanged at 4.90c. per lb., New York. The London market has been rather quiet with interest centered on future deliveries. Prompt metal this morning was quoted at 3.54c. per lb., London, up four points from yesterday's price.

Tin

Weak securities prices and reductions in copper quotations were reflected in the dull and featureless market of the past week. Very little buying was done as prices dropped as low as 40.25c. on Friday. Today's Straits quotation of 40.875c. per lb., New York, prompt delivery, is 0.125c. below the price of a week ago. Domestic deliveries of tin in January were 5550 tons, an increase of 530 tons over December, but 2065 tons below January, 1937. A large portion of this increase was caused by the new ruling that limits dock storage to 10 days. Tin that had been stored on piers was moved into railroad transfers and thus entered into the "delivered" classification, although actually the metal had not been delivered into consumption.

IRON AND STEEL SCRAP

... Some grades are weaker at Philadelphia and Cleveland.

• • •

... Composite remains unchanged at \$14.

FEB. 1.—Despite the fact that domestic trading has been at a standstill for weeks, the market undertone continues fairly strong. Prices on the principal melting grades remain unchanged in the leading centers, leaving THE IRON AGE composite unchanged at \$14 for the fifth week. Decline in operations, however, has sentimentally affected specialty grades at Philadelphia, and the market is off 50c. on leading items at Cleveland for the same reason. On the other hand, low phosphorus items are up 50c. at Pittsburgh. Practically the only trading reported consists of continued price averaging deals at Buffalo and the purchase of 1500 tons of heavy melting steel at St. Louis. There has been some speculative buying of automotive salvage material, but the tonnages for February will be very light due to plant inactivity.

Export prices are unchanged, although occasionally one hears of an exceptional price paid for material picked up at the last moment to fill a boat that is short its full tonnage. Japanese inquiries are reported, but no new orders on the East Coast.

Pittsburgh

Despite lack of interest on the part of consumers, the market undertone continues strong. This condition is almost entirely due to export influences. One broker in this district continues to pay \$14 a ton for No. 1 steel and some dealers have paid as high as \$14.25 for scrap applied on portions of old orders released for prompt shipment. This latter condition indicates the difficulty encountered in picking up scrap in a hurry. A small tonnage of No. 1 steel has been sold into consumption at \$14 a ton during the past week, but quotations continue unchanged in view of other factors mentioned above.

Chicago

Scrap prices are unaltered this week, the market seeming unable to shake off its lethargy. Trading is at an utter standstill.

Philadelphia

Sentiment is even further depressed because of the failure of steel mill operations here to improve and also because

of the decline in the national steel operating rate for the week. No. 1 and No. 2 steels are unchanged price-wise, however, as there are still sporadic purchases for export at \$14 and \$15 respectively, and it is very unlikely that any domestic user could pick up a tonnage of No. 1 for much less than \$15. Specialty grades are off 50c. on sentiment alone, and turnings particularly are a drug on the market and are freely obtainable at \$8 or less. Oddly enough, bids yesterday on the January Budd list of compressed bundles were considerably higher than bids entered a month before, which hardly conforms to the sharp drop in sentiment during the past fortnight.

Cleveland

Scrap is weaker sentimentally, No. 1 heavy melting steel being quoted down 50c. to \$12 to \$12.50 per ton and similar reductions being made in No. 2 heavy melting, compressed sheets, bundled stampings, drop forge flashings No. 1 bushelling, low phosphorus billet and bloom crops, No. 1 cast and rails under 3 ft. In the Youngstown district, machine shop turnings are \$9.50 to \$10, down 50c. from the previous quotation. Movement of the cast grades has been slightly better, principally to Sharon and Youngstown, but there has been very little activity in any of the other materials. Mills continue out of the market for the heavy melting grades. Dealers report that scrap is no freer.

Buffalo

The leading consumer, who has had an arrangement to take additional tonnage in order to average down its high-priced scrap orders, is receiving material at a rate between 200 and 500 tons a day. So far about 3000 tons have been taken in under the latest plan. The price is \$13 for No. 1; \$11 for No. 2 and \$10 for old bundles. The mill does not want machine shop turnings which it cannot lay down under present conditions, so the differential on this commodity is weaker than it otherwise would be. The only buyers at present are vicinity consumers who are paying about \$8, delivered.

St. Louis

A steel mill in the St. Louis industrial district bought 1500 tons of heavy melting steel for delivery over the next 30 to 60 days. This was the first sale of any consequence made to a local consumer since Nov. 13. Shipments will be made from stocks of St. Louis dealers, who say they could not buy the material and pay freight on it except at a loss. Very little scrap iron is said to be com-

ing in from the country, and the Southwest territory is shipping its material to the Gulf ports for export, which trade is on the increase, with prices about \$1 a ton higher. Prices on the local market are unchanged.

Cincinnati

There is virtually no activity in the old materials market. Here and there small amounts of foundry scrap change hands, but prices are not sufficiently attractive to bring trading. Mills are apathetic toward additional material, and fair stocks are reported on hand.

Detroit

The scrap market continued firm during the last week despite continued lack of mill demand. Numerous automotive lists were closed with speculative buying keeping prices near the quoted range. Chrysler, for instance, closed Monday on short shovel turnings at approximately \$6.90. Mixed turnings were reported bought at \$5.75 and were the only item that showed softness. In most cases, producers have offered accumulations without estimating the probable tonnages. Those who did list the number of carloads expected for the next month estimated approximately one-third the usual amount. In the experience of buyers last month, estimates turned out to be about twice as great as production. For February, output will be extremely light with automotive firms reducing schedules in some plants to only one day a week.

New York

Prices for material on cars for domestic shipment are nominally unchanged in the absence of test. Domestic mills have been out of the metropolitan New York market for weeks. Exporters have not changed their buying prices for over three months, and although little material is coming out, none feel that additional tonnages would be attracted by higher prices. Instances have been cited where partly filled boats have left here for more southerly ports where some fancy prices have been paid for the last thousand tons of the load. Such transactions, however, hardly set the market. A hard freeze is likely to temporarily strengthen the market by producing an artificial scarcity.

Boston

A consumer of steel turnings dropped his price from \$3.40 a ton on cars to \$2.90 and then withdrew. Weirton bundled skeleton consumers have also withdrawn from the market, and with the only two heretofore active factors out, the domestic market is at a standstill. The export market, however, continues active and prices fluctuate. As high as \$15 was paid last week for a round tonnage of high-grade stock, delivered dock, but on Monday and Tuesday the highest price paid was \$14.50, leaving quotations unchanged from the previous week.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton to delivered to consumer:

No. 1 hvy. mltng. steel.	\$14.00 to \$14.50
Railroad hvy. mltng.	15.50 to 16.00
No. 2 hvy. mltng. steel.	13.00 to 13.50
Scrap rails	16.00 to 16.50
Rails 3 ft. and under.	18.00 to 18.50
Comp. sheet steel	14.00 to 14.50
Hand bundled sheets.	13.00 to 13.50
Hvy. steel axle turn.	12.50 to 13.00
Machine shop turn.	8.00 to 8.50
Short shov. turn.	8.00 to 8.50
Mixed bor. & turn.	6.75 to 7.25
Cast iron borings	6.75 to 7.25
Cast iron carwheels.	15.00 to 15.50
Hvy. breakable cast.	12.50 to 13.00
No. 1 cupola cast.	16.00 to 16.50
RR. knuckles & cplrs.	18.00 to 18.50
Rail coll & leaf springs	18.00 to 18.50
Rolled steel wheels.	18.00 to 18.50
Low phos. billet crops.	18.00 to 18.50
Low phos. sh. bar	17.50 to 18.00
Low phos. punchings.	17.00 to 17.50
Low phos. plate, hvy.	17.00 to 18.00
Low phos. plate clips.	15.00 to 15.50
Steel car axles.	17.50 to 18.00

PHILADELPHIA

Per gross ton to delivered to consumer:

No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
No. 2 hvy. mltng. steel.	13.50 to 14.00
Hydraulic bund., new.	14.50 to 15.00
Hydraulic bund., old.	10.50 to 11.00
Steel rails for rolling.	16.50 to 17.00
Cast iron carwheels.	15.50 to 16.00
Hvy. breakable cast.	13.50 to 14.00
No. 1 cast.	16.00 to 16.50
Stove plate (steel wks.)	12.50 to 13.00
Railroad malleable	15.50 to 16.00
Machine shop turn.	7.75 to 8.00
No. 1 blast furnace	7.00 to 7.50
Cast borings	8.00 to 8.50
Heavy axle turnings	11.00 to 11.50
No. 1 low phos. hvy.	17.50 to 18.00
Couplers & knuckles.	17.50 to 18.00
Rolled steel wheels.	17.50 to 18.00
Steel axles	19.50 to 20.00
Shafting	19.00 to 19.50
No. 1 RR. wrought.	15.50 to 16.00
Spec. iron & steel pipe	12.50 to 13.00
No. 1 forge fire.	11.50 to 12.00
Cast borings (chem.)	13.00 to 13.50

CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mltng. steel	\$12.75 to \$13.25
Auto. hvy. mltng. steel	
alloy free	11.25 to 11.75
No. 2 auto. steel	10.75 to 11.25
Shoveling steel	12.75 to 13.25
Hydraul. comp. sheets	11.75 to 12.25
Drop forge flashings	10.25 to 10.75
No. 1 busheling	11.75 to 12.25
No. 2 busheling, old.	5.75 to 6.25
Rolled carwheels	16.00 to 16.50
Railroad tires, cut	16.25 to 17.25
Railroad leaf springs	17.00 to 17.50
Steel coup. & knuckles	16.00 to 16.50
Axle turnings	12.00 to 12.50
Coil springs	17.50 to 18.00
Axle turn. (elec.)	12.50 to 13.00
Low phos. punchings.	16.00 to 16.50
Low phos. plates, 12 in. and under	15.50 to 16.00
Cast iron borings	6.25 to 6.75
Short shov. turnings	8.00 to 8.50
Machine shop turn.	6.50 to 7.00
Rerolling rails	15.25 to 15.75
Steel rails under 3 ft.	15.50 to 16.00
Steel rails under 2 ft.	16.00 to 16.50
Angle bars, steel	15.25 to 15.75
Cast iron carwheels	15.25 to 15.75
Railroad malleable	14.25 to 14.75
Agric. malleable	12.25 to 12.75
Per Net Ton	
Iron car axles	\$19.00 to \$19.50
Steel car axles	17.50 to 18.00
No. 1 RR. wrought.	10.50 to 11.00
No. 2 RR. wrought	11.25 to 11.75
Locomotive tires	16.25 to 16.75
Pipes and flues	9.25 to 9.75
No. 1 machinery cast.	12.50 to 12.75
Clean auto. cast	12.00 to 12.50
No. 1 railroad cast.	11.25 to 11.75
No. 1 agric. cast.	11.25 to 11.75
Stove plate	9.00 to 9.50
Grate bars	9.00 to 9.50
Brake shoes	8.50 to 9.00

YOUNGSTOWN

Per gross ton to delivered to consumer:

No. 1 hvy. mltng. steel.	\$13.00 to \$13.50
Hydraulic bundles	12.50 to 13.00
Machine shop turn.	9.50 to 10.00

CLEVELAND

Per gross ton to delivered to consumer:

No. 1 hvy. mltng. steel.	\$12.00 to \$12.50
No. 2 hvy. mltng. steel.	11.00 to 11.50
Comp. sheet steel	11.50 to 12.00
Light bund. stampings.	8.50 to 9.00
Drop forge flashings.	11.00 to 11.50
Machine shop turn.	7.50 to 8.00
Short shov. turn.	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
Steel axle turnings	10.00 to 10.50
Low phos. billet and bloom crops	18.00 to 18.50
Cast iron borings	8.50 to 9.00
Mixed bor. & turn.	8.50 to 9.00
No. 2 busheling	8.50 to 9.00
No. 1 cast	16.00 to 16.50
Railroad grate bars.	8.00 to 8.50
Stove plate	8.00 to 8.50
Rails under 3 ft.	17.50 to 18.00
Rails for rolling	16.00 to 16.50
Railroad malleable	16.00 to 16.50
Cast iron carwheels.	15.00 to 15.50

BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel.	\$13.00
No. 2 hvy. mltng. steel.	11.00
Scrap rails	\$13.00 to 13.50
New hvy. b'nded sheets	11.00
Old hydraulic bundles.	10.00
Drop forge flashings	11.00
No. 1 busheling	11.00
Hvy. axle turnings	11.50 to 12.00
Machine shop turn.	6.25 to 6.75
Knuckles & couplers.	16.50 to 17.00
Coil & leaf springs.	16.50 to 17.00
Rolled steel wheels.	16.50 to 17.00
Low phos. billet crops.	17.50 to 18.00
Shov. turnings	8.50 to 9.00
Mixed bor. & turn.	7.50 to 8.00
Cast iron borings.	7.50 to 8.00
Steel car axles	16.50 to 17.00
No. 1 machinery cast.	15.50 to 16.00
No. 1 cupola cast.	14.00 to 14.50
Stove plate	12.00 to 12.50
Steel rails under 3 ft.	18.00 to 18.50
Cast iron carwheels.	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Chemical borings	10.50 to 11.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	\$13.00 to \$13.50
No. 1 hvy. melting.	13.00 to 13.50
No. 2 hvy. melting.	12.00 to 12.50
No. 1 locomotive tires.	16.00 to 16.50
Misc. stand.-sec. rails.	14.00 to 14.50
Railroad springs	15.50 to 16.00
Bundled sheets	10.00 to 10.50
No. 1 busheling	7.00 to 7.50
Cast bor. & turn.	6.00 to 6.50
Rails for rolling	14.50 to 15.00
Machine shop turn.	6.00 to 6.50
Heavy turnings	8.50 to 9.00
Steel car axles.	19.50 to 20.00
Iron car axles.	21.50 to 22.00
No. 1 RR. wrought.	8.00 to 8.50
No. 2 RR. wrought.	13.50 to 14.00
Steel rails under 3 ft.	13.00 to 13.50
Steel angle bars	14.50 to 15.00
Cast iron carwheels.	13.50 to 14.00
No. 1 machinery cast.	12.75 to 13.25
Railroad malleable	13.50 to 14.00
No. 1 railroad cast.	12.00 to 12.50
Stove plate	9.00 to 9.50
Agricul. malleable	10.00 to 10.50
Grate bars	9.50 to 10.00
Brake shoes	9.50 to 10.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	\$9.50 to \$10.00
No. 2 hvy. mltng. steel.	7.50 to 8.00
Scrap rails for mltng.	14.50 to 15.00
Loose sheet clippings.	6.00 to 6.50
Hydraul. b'nded sheets	9.50 to 10.00
Cast iron borings.	3.50 to 4.00
Machine shop turn.	4.00 to 4.50
No. 1 busheling.	8.00 to 8.50
No. 2 busheling.	3.00 to 3.50
Rails for rolling.	16.50 to 17.00
No. 1 locomotive tires.	13.00 to 13.50
Short rails	17.00 to 17.50
Cast iron carwheels.	11.50 to 12.00
No. 1 machinery cast.	10.50 to 11.00
No. 1 railroad cast.	9.00 to 9.50
Burnt cast	5.50 to 6.00
Stove plate	5.50 to 6.00
Agricul. malleable	10.50 to 11.00
Railroad malleable	12.50 to 13.00
Mixed hvy. cast.	7.50 to 8.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel.	\$11.50 to \$12.00
Scrap steel rails	14.00 to 14.50
Short shov. turnings.	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought.	10.00
Rails for rolling	15.00 to 16.00
No. 1 cast	14.00 to 16.50
Tramcar wheels	14.00 to 15.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	\$9.50 to \$10.00
No. 2 hvy. mltng. steel.	8.00 to 8.50
Borings and turnings.	6.25 to 6.75
Long turnings	5.75 to 6.25
Short shov. turnings.	6.75 to 7.25
No. 1 machinery cast.	11.75 to 12.25
Automotive cast	12.75 to 13.25
Hvy. breakable cast.	10.25 to 10.75
Hydraul. comp. sheets.	10.75 to 11.25
Stove plate	7.50 to 8.00
New factory bushel.	9.50 to 10.00
Old No. 2 busheling.	5.00 to 5.50
No. 2 busheling (black fender stock)	Nominal
Sheet clippings	7.25 to 7.75
Flashings	8.50 to 9.00
Low phos. plate scrap.	10.50 to 11.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	\$11.00 to \$11.50
No. 2 hvy. mltng. steel.	9.50 to 10.00
Hvy. breakable cast.	10.50 to 11.00
No. 1 machinery cast.	11.50 to 12.00
No. 2 cast.	9.50 to 10.00
Stove plate	9.00 to 9.50
Steel car axles	20.00 to 20.50
Shafting	16.00 to 16.50
No. 1 RR. wrought.	11.50 to 12.00
No. 1 wrought long.	10.00 to 10.50
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings.	5.00 to 5.50
Cast borings*	5.00 to 5.50
No. 1 blast furnace	5.00 to 5.50
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	7.50 to 8.00
Light iron	4.00 to 4.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast.	\$15.50 to \$16.00
No. 2 cast	13.00 to 13.50

*\$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	\$13.30 to \$13.80
Scrap rails	13.30 to 13.80
No. 2 steel.	12.30 to 12.80
Breakable cast.	9.40
Machine shop turn.	3.15
Mixed bor. & turn.	2.50
Bun. skeleton long.	7.00 to 7.10
Shafting	17.50 to 18.00
Cast bor. chemical.	6.25 to 6.50
Per gross ton delivered consumers' yards:	
Textile cast.	\$15.50 to \$16.00
No. 1 machine cast.	15.50 to 16.00

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$11.65 to \$12.15
No. 2 hvy. mltng. steel.	10.65 to 11.15

CANADA

Dealers' buying prices at their yards, per gross ton:

Toronto Montreal	
No. 1 hvy. mltng. steel.	\$10.50 \$9.50
No. 2 hvy. mltng. steel.	9.50 8.50
Mixed dealers steel.	8.50 7.50
Scrap pipe	8.50 7.50
Steel turnings	7.50 7.00
Cast borings	8.50 7.50
Machinery cast	15.00 14.00
Dealers cast	13.00 12.00
Stove plate	11.00 10.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel.	\$13.50
No. 2 hvy. mltng. steel.	12.00
No. 2 cast	11.00
Stove plate	8.50 to 9.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel.	\$14.00 to \$14.50
No. 2 hvy. mltng. steel.	13.00 to 13.50
Rails (scrap)	14.00 to 14.50
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
No. 2 hvy. mltng. steel.	13.50 to 14.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton
Rerolling\$37.00
Forging quality 43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open-hearth or Besse-mer\$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and sheared2.10c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton
F.o.b. Pittsburgh or Cleveland.....\$47.00
F.o.b. Chicago, Youngstown or Anderson, Ind. 48.00
F.o.b. Worcester, Mass. 49.00
F.o.b. Birmingham 50.00
F.o.b. San Francisco 56.00
F.o.b. Galveston 53.00
Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.
F.o.b. Pittsburgh 2.45c.
F.o.b. Chicago or Gary 2.50c.
F.o.b. Duluth 2.60c.
Del'd Detroit 2.60c.
F.o.b. Cleveland 2.50c.
F.o.b. Buffalo 2.55c.
Del'd Philadelphia 2.75c.
Del'd New York 2.80c.
F.o.b. Birmingham 2.60c.
F.o.b. cars dock Gulf ports..... 2.85c.
F.o.b. cars Pacific Ports..... 3.00c.

Rail Steel

(For merchant trade)
F.o.b. Pittsburgh 2.30c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill. 2.35c.
F.o.b. Buffalo 2.40c.
F.o.b. Birmingham 2.45c.
F.o.b. cars dock Gulf ports .. 2.70c.
F.o.b. cars dock Pacific ports.. 2.85c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)
F.o.b. Pittsburgh 2.45c.
F.o.b. Buffalo, Cleveland Youngstown, Chicago, Gary or Birmingham 2.50c.
Del'd Detroit 2.60c.
F.o.b. cars dock Gulf ports..... 2.85c.
F.o.b. cars dock Pacific ports.. 2.95c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)
F.o.b. Pittsburgh 2.30c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.35c.
F.o.b. cars dock Gulf ports..... 2.70c.
F.o.b. cars dock Pacific ports.. 2.80c.

Iron

F.o.b. Chicago 2.40c.
F.o.b. Pittsburgh (refined) 3.60c.

Cold Finished Bars and Shafting*

Base per Lb.
F.o.b. Pittsburgh 2.90c.
F.o.b. Cleveland, Chicago and Gary 2.95c.
F.o.b. Buffalo 3.00c.
F.o.b. Detroit 2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

Base per Lb.
F.o.b. Pittsburgh 2.25c.
F.o.b. Chicago or Gary 2.30c.
Del'd Cleveland 2.445c.
F.o.b. Coatesville or Spar. Pt. . 2.35c.
Del'd Philadelphia 2.44c.
Del'd New York 2.54c.

F.o.b. Birmingham 2.40c.
F.o.b. cars dock Gulf ports ... 2.65c.
F.o.b. cars dock Pacific ports. 2.80c.
Wrought iron plates, f.o.b. Pittsburgh 3.80c.

Floor Plates

F.o.b. Pittsburgh 3.50c.
F.o.b. Chicago 3.55c.
F.o.b. Coatesville 3.60c.
F.o.b. cars dock Gulf ports ... 3.90c.
F.o.b. cars dock Pacific ports. 4.05c.

Structural Shapes

Base per Lb.
F.o.b. Pittsburgh 2.25c.
F.o.b. Chicago 2.30c.
Del'd Cleveland 2.445c.
F.o.b. Buffalo or Bethlehem. . 2.35c.
Del'd Philadelphia 2.465c.
Del'd New York 2.5125c.
F.o.b. Birmingham (standard) 2.40c.
F.o.b. cars dock Gulf ports ... 2.60c.
F.o.b. cars dock Pacific ports. 2.80c.

Steel Sheet Piling

Base per Lb.
F.o.b. Pittsburgh 2.60c.
F.o.b. Chicago or Buffalo 2.70c.
F.o.b. cars dock Gulf or Pacific Coast ports 3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton.....\$42.50
Angle bars, per 100 lb. 2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton\$43.00
Light rails (from rail steel) per gross ton 42.00

Base per Lb.
Spikes 3.15c.
Tie plates, steel 2.30c.
Tie plates, Pacific Coast ports. 2.40c.
Track bolts, to steam railroads 4.35c.
Track bolts, to jobbers, all sizes (per 100 counts)

65-5 per cent off list
Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.
No. 10, f.o.b. Pittsburgh 2.40c.
No. 10, f.o.b. Gary 2.50c.
No. 10, del'd Detroit 2.60c.
No. 10, del'd Philadelphia 2.70c.
No. 10, f.o.b. Granite City 2.60c.
No. 10, f.o.b. Birmingham 2.55c.
No. 10, f.o.b. cars dock Pacific ports 2.95c.
No. 10 wrought iron, P'gh.... 4.25c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh 3.15c.
No. 24, f.o.b. Gary 3.25c.
No. 24, del'd Detroit 3.35c.
No. 24, del'd Philadelphia 3.45c.
No. 24, f.o.b. Granite City 3.35c.
No. 24, f.o.b. Birmingham 3.30c.
No. 24, f.o.b. cars dock Pacific ports 3.80c.
No. 24, wrought iron, Pittsburgh 5.15c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh . 3.10c.
No. 10 gage, f.o.b. Gary 3.20c.
No. 10 gage, f.o.b. Detroit 3.30c.
No. 10 gage, del'd Philadelphia 3.40c.
No. 10, f.o.b. Granite City.... 3.30c.
No. 10 gage, f.o.b. Birmingham. 3.25c.
No. 10 gage, f.o.b. cars dock Pacific ports 3.70c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh. 3.55c.
No. 20 gage, f.o.b. Gary 3.65c.
No. 20 gage, del'd Detroit 3.75c.
No. 20 gage, del'd Philadelphia 3.85c.
No. 20, f.o.b. Granite City 3.75c.
No. 20 gage, f.o.b. Birmingham 3.70c.
No. 20 gage, f.o.b. cars, dock Pacific ports 4.10c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh. 3.80c.
No. 24, f.o.b. Gary 3.90c.
No. 24, del'd Philadelphia 4.10c.

No. 24, f.o.b. Granite City 4.00c.
No. 24, f.o.b. Birmingham 3.95c.
No. 24, f.o.b. cars, dock, Pacific ports 4.40c.
No. 24, wrought iron, Pittsburgh 6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.
Field grade 3.35c.
Armature 3.70c.
Electrical 4.20c.
Special Motor 5.10c.
Special Dynamo 5.80c.
Transformer 6.30c.
Transformer Special 7.30c.
Transformer Extra Special... 7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.
Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh 4.10c.
F.o.b. Gary 4.20c.
F.o.b. cars dock, Pacific ports 4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh 3.50c.
No. 20, f.o.b. Gary 3.60c.
No. 20, f.o.b. Granite City 3.70c.
No. 20, f.o.b. cars dock Pacific ports 4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb. 3.30c.
No. 28, Gary 3.40c.
No. 28, f.o.b. Granite City.... 3.50c.
No. 28, cars dock Pacific ports, boxed 4.175c.

Tin Plate

Base per Box
Standard cokes, f.o.b. Pittsburgh district mill\$5.35
Standard cokes, f.o.b. Gary.... 5.45
Standard coke, f.o.b. Granite City 5.55

Special Coated Manufacturing Ternes

Base per Box
F.o.b. Pittsburgh\$4.65
F.o.b. Gary 4.75
F.o.b. Granite City 4.85

Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)
8-lb. coating I.C.\$12.00
15-lb. coating I.C. 14.00
20-lb. coating I.C. 15.00
25-lb. coating I.C. 16.00
30-lb. coating I.C. 17.25
40-lb. coating I.C. 19.50

Hot-rolled Hoops, Bands, Strip and Flats under 1/4 in.

Base per Lb.
All widths up to 24 in., Pittsburgh 2.40c.
All widths up to 24 in., Chicago. 2.50c.
All widths up to 24 in., del'd Detroit 2.60c.
All widths up to 24 in., Granite City 2.60c.
All widths up to 24 in., Birmingham 2.55c.
Cooperage stock, Pittsburgh... 2.50c.
Cooperage stock, Chicago.... 2.60c.

Cold-Rolled Strip*

Base per Lb.
F.o.b. Pittsburgh 3.20c.
F.o.b. Cleveland 3.20c.
Del'd Chicago 3.48c.
F.o.b. Worcester 3.40c.

*Carbon 0.25 and less.

Cold Rolled Spring Steel

Pittsburgh and Cleveland Worcester
Carbon 0.25-0.50% 3.20c. 3.40c.
Carbon .51-.75 4.45c. 4.65c.
Carbon .76-1.00 6.30c. 6.50c.
Carbon Over 1.00 8.50c. 8.70c.

Fender Stock

No. 14, Pittsburgh or Cleveland. 3.45c.
No. 14, Worcester 3.55c.
No. 14, Pittsburgh or Cleveland. 3.85c.
No. 20, Worcester 4.25c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)
To Manufacturing Trade

Per Lb.
Bright wire 2.90c.
Galvanized wire 2.95c.
Spring wire 3.50c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To the Trade

Base per Keg
Standard wire nails \$2.75
Smooth coated nails 2.75
Cut nails, carloads 3.60

Base per 100 Lb.
Annealed fence wire \$3.15
Galvanized fence wire 3.55
Polished staples 3.45
Galvanized staples 3.70
Barbed wire, galvanized 3.40
Twisted barbed wire 3.40
Woven wire fence, base column. .75
Single loop bale ties, base col. .63
Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.
On nails, staples and barbed wire, prices of \$6 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh
District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Steel		Wrought Iron	
In.	Black Galv.	In.	Black Galv.
1/2	.52	3/4	.55
3/4	.55	1	.58
1	.59	1 1/4	.62
1 1/4	.62	1 1/2	.65
1 1/2	.64	1 3/4	.68
2	.67	2	.70

Lap Weld		Butt Weld	
In.	Black Galv.	In.	Black Galv.
1/2	.52	3/4	.55
3/4	.55	1	.58
1	.59	1 1/4	.62
1 1/4	.62	1 1/2	.65
1 1/2	.64	1 3/4	.68
2	.67	2	.70

Butt Weld, extra strong, plain ends		Lap Weld, extra strong, plain ends	
In.	Black Galv.	In.	Black Galv.
1/2	.52	3/4	.55
3/4	.55	1	.58
1	.59	1 1/4	.62
1 1/4	.62	1 1/2	.65
1 1/2	.64	1 3/4	.68
2	.67	2	.70

Lap Weld, extra strong, plain ends		Butt Weld, extra strong, plain ends	
In.	Black Galv.	In.	Black Galv.
1/2	.52	3/4	.55
3/4	.55	1	.58
1	.59	1 1/4	.62
1 1/4	.62	1 1/2	.65
1 1/2	.64	1 3/4	.68
2	.67	2	.70

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes
(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

Cold Drawn		Hot Rolled	
In.	Black Galv.	In.	Black Galv.
1 in. o.d.	13 B.W.G.	1 1/4 in. o.d.	13 B.W.G.
1 1/4 in. o.d.	13 B.W.G.	1 1/2 in. o.d.	13 B.W.G.
1 1/2 in. o.d.	13 B.W.G.	1 3/4 in. o.d.	13 B.W.G.
1 3/4 in. o.d.	13 B.W.G.	2 in. o.d.	13 B.W.G.
2 in. o.d.	13 B.W.G.	2 1/4 in. o.d.	13 B.W.G.
2 1/4 in. o.d.	13 B.W.G.	2 1/2 in. o.d.	13 B.W.G.
2 1/2 in. o.d.	13 B.W.G.	2 3/4 in. o.d.	13 B.W.G.
2 3/4 in. o.d.	13 B.W.G.	3 in. o.d.	13 B.W.G.
3 in. o.d.	13 B.W.G.	3 1/4 in. o.d.	13 B.W.G.
3 1/4 in. o.d.	13 B.W.G.	3 1/2 in. o.d.	13 B.W.G.
3 1/2 in. o.d.	13 B.W.G.	3 3/4 in. o.d.	13 B.W.G.
3 3/4 in. o.d.	13 B.W.G.	4 in. o.d.	13 B.W.G.
4 in. o.d.	13 B.W.G.	4 1/4 in. o.d.	13 B.W.G.
4 1/4 in. o.d.	13 B.W.G.	4 1/2 in. o.d.	13 B.W.G.
4 1/2 in. o.d.	13 B.W.G.	4 3/4 in. o.d.	13 B.W.G.
4 3/4 in. o.d.	13 B.W.G.	5 in. o.d.	13 B.W.G.
5 in. o.d.	13 B.W.G.	5 1/4 in. o.d.	13 B.W.G.
5 1/4 in. o.d.	13 B.W.G.	5 1/2 in. o.d.	13 B.W.G.
5 1/2 in. o.d.	13 B.W.G.	5 3/4 in. o.d.	13 B.W.G.
5 3/4 in. o.d.	13 B.W.G.	6 in. o.d.	13 B.W.G.

Extra for less-carload quantities:
40,000 lb. or ft. or over Base
30,000 lb. or ft. to 39,999 lb. or ft. 5%
20,000 lb. or ft. to 29,999 lb. or ft. 10%
10,000 lb. or ft. to 19,999 lb. or ft. 20%
5,000 lb. or ft. to 9,999 lb. or ft. 30%
2,000 lb. or ft. to 4,999 lb. or ft. 45%
Under 2,000 lb. or ft. 65%

CAST IRON WATER PIPE

Per Net Ton
*6-in. and larger, del'd Chicago. \$55.00
6-in. and larger, del'd New York 53.00
*6-in. and larger, Birmingham. 47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles. 56.00
F.o.b. dock, Seattle 56.00
4-in. f.o.b. dock, San Francisco or Los Angeles 59.00
F.o.b. dock, Seattle 59.00

Class "A" and gas pipe, \$3 extra
4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$46. Birmingham, and \$54 delivered Chicago and 4-in. pipe, \$49, Birmingham, and \$58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List
Machine and carriage bolts:
1/2 in. x 6 in. and smaller. .65 and 5*
Larger and longer up to
1 in.60 and 10*
1 1/2 in. and larger.60 and 5*
Lag bolts60 and 10*
Plow bolts, Nos. 1, 2, 3
and 765 and 5
Hot pressed nuts, and c.p.c
and t nuts, square or hex.
blank or tapped:
1/2 in. and smaller.65
9/16 in. to 1 in. inclusive. .60 and 5
1 1/4 in. and larger.60

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.

1/2 in. and smaller 60 and 10
9/16 in. to 1 in. inclusive. 60 and 5
1 1/4 in. and larger 60
Stove bolts in packages, nuts attached 70
Stove bolts in packages, with nuts separate 70 and 10
Stove bolts in bulk 80

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2 in. and larger)
Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland. \$3.60
F.o.b. Chicago or Birmingham. 3.70

Small Rivets

(7/16 in. and smaller)
Per Cent Off List
F.o.b. Pittsburgh 65 and 5
F.o.b. Cleveland 65 and 5
F.o.b. Chicago and Birmingham 65 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more.)
Per Cent Off List
Milled cap screws, 1 in. dia. and smaller 50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller 75
Milled headless set screws, cut thread 3/4 in. and smaller. 75
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller 60
Upset set screws, cup and oval points 75
Milled studs 65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$60 a gross ton.
Alloy Steel Bars
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base 3.00c.
Delivered, Detroit 3.15c.
S.A.E. Alloy
Series
Numbers
200 (1/4% Nickel) \$0.35
2100 (1 1/2% Nickel) 0.75
2300 (3/4% Nickel) 1.55

2500 (5% nickel)	\$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel.	0.15
6100 Chromium-vanadium bar.	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

Alloy Cold-Finished Bars
F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel		Straight Chrome	
No. 304	No. 302	No. 410	No. 430
Forging billets 21.25c.	20.40c.	410	430
Bars 25c.	24c.	410	430
Plates 29c.	27c.	410	430
Structural shapes. 25c.	24c.	410	430
Sheets 36c.	34c.	410	430
Hot-rolled strip .. 23.50c.	21.50c.	410	430
Cold-rolled strip .. 30c.	28c.	410	430
Drawn wire 25c.	24c.	410	430

Straight Chrome		Straight Chrome	
No. 410	No. 430	No. 442	No. 446
Bars ..18.50c.	19c.	22.50c.	27.50c.
Plates 21.50c.	22c.	25.50c.	30.50c.
Sheets 26.50c.	29c.	32.50c.	36.50c.
Hot strip 17c.	17.50c.	23c.	28c.
Cold stp. 22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL
High speed 80c.
High-carbon-chrome 43c.
Oil-hardening 24c.
Special 22c.
Extra 18c.
Regular 14c.
Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, ex-port	£20 Nominal
Tin plate, per base box	22s. 6d. to 23s.
Steel bars, open hearth. £11	2s. 6d.
Beams, open-hearth ... £11	7s. 6d.
Channels, open-hearth ... £11	2s. 6d.
Angles, open-hearth ... £11	2s. 6d.
Black sheets, No. 24 gage. £14	
Galvanized sheets, No. 24 gage	£16 15s.

CONTINENTAL

Per Gross Ton, G.O'd & f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate 1/4 in. and up.	£6 17s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, 1/4 in.	£7 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base.	£5 15s.

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Base per Lb.
Plates	3.70c.
Structural shapes	3.70c.
Soft-steel bars and small shapes	3.80c.
Reinforcing steel bars	2.45c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs \$3.65
Per Cent Off List	
Track bolts, all sizes per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'l'd, base per 100 lb.	\$3.30
Wire, galv. soft, base per 100 lb.	\$3.70
Common wire nails, per keg	\$2.90
Cement coated nails, per keg	\$2.90

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

* Delivered in Pittsburgh switching district.

** Prices on application.

CHICAGO Base per Lb.

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	\$4.40
Track bolts (keg lots)	5.05
Rivets, structural (keg lots)	**4.95
Rivets, boiler (keg lots)	**5.05
Per Cent Off List	
Machine bolts and carriage bolts, 1/2 in. and smaller	60
Lag screws	*55 and 5
Hot-pressed nuts, sq. and hex., tap or blank, 1/2 by 6 in. and smaller	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Com. wire nails, 15 kegs or more, per keg	\$3.20
Cement c'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

* These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

** Base at 100 lb.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. charcoal	7.25 to 7.50c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled; strip, soft and quarter hard	3.92c.

Hoops	4.32c.
Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'l'd sheets (No. 24*)	4.50 to 4.82c.
Galvanized sheets (No. 24*)	5.00c.
Long terme sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.50c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) for quantities 400 to 1499 lb.	
Standard quality	5.40c.
Deep drawing	6.05c.
Stretcher leveled	6.05c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, 1/4 in. and heavier	5.60c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Tire steel, 1 x 1/2 in. and larger	4.61c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	3.25c.

Per Cent Off List

Machine bolts, square head and nut: All diameters. Prices on application
Carriage bolts, cut thread: All diameters. Prices on application

* For 1500 lb. or more; add 0.25c. on smaller lots. No. 28 and lighter, 36 in. wide, 20c. per 100 lb. higher.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	5.29c.
Boiler rivets	5.39c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller 50
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, nuts; all quantities 60

* No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	3.90c.
*Structural shapes	3.90c.
*Soft steel bars, small shapes, iron bars (except bands)	4.00c.
*Reinforc. steel bars, square and deformed	3.53c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.35c.
*Steel bands, No. 12 and 3/16 in. incl.	4.10c.
*Spring steel	5.50c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	4.00c.
*Diam. pat. floor plates, 1/4 in.	5.25c.

These prices are for delivery in Philadelphia trucking area.

* Base prices subject to deduction on orders aggregating 4000 lb. or over.
† For 25 bundles or over.
‡ For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.86c.
Soft steel bars	3.75c.

†Reinforc. steel bars	2.50c.
‡Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
*Black ann'l'd wire, per 100 lb.	\$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95
Per Cent Off List	
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count	
1/2 in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

† Outside delivery 10c. less.

* For 5000 lb. or less.

‡ Plus switching and carriage charges and quantity differentials up to 50c.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.95c.
Floor plates	5.55c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	\$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$3.48
Com. wire nails, base per keg: Any quantity less than carload	3.20
Cement c'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35
Net per 100 Ft.	
Seamless steel boiler tubes,	
2-in.	\$21.80
4-in.	52.45
Lap-welded steel boiler tubes,	
2-in.	20-73
4-in.	48.41

BUFFALO

	Base per Lb.
Plates	3.92c.
Floor plates	5.52c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in. 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg	\$3.26
Black wire, base per 100 lb. (2500-lb. lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON

	Base per Lb.
Channels, angles	4.20c.
Tees and zeos, under 3 in.	4.45c.
H beams and shapes	4.07c.
Plates—Sheared, tank and univ. mill, 1/4 thick and heavier	4.08c.
Floor plates, diamond pattern	5.13c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars.....	3.49c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10).....	3.94c.
Galvanized sheets (No. 24)*.....	5.40c.
Bands and hoops.....	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

*Under 400 lb., .50c. over base, 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes..	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles...	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24).....	5.36c.
Cold-finished steel bars.....	4.41c.
Structural rivets (keg lots).....	5.16c.
Boiler rivets, cone head (keg lots)	5.26c.
Track spikes (keg lots).....	4.61c.
Track bolts (keg lots).....	5.81c.
Black annealed wire (No. 6 to No. 9 incl.).....	4.05c.
Com. wire nails and cement coated nails 1 to 14 kegs.....	3.25c.

	Per Cent Off List
Machine bolts and carriage bolts, 1/2x6 and smaller or shorter....	65
Larger and longer up to 1 in., diam.	60-5
1 1/4 in. and larger.....	60
Coach and lag screws.....	60-5
Hot-pressed nuts, sq. and hex. tapped or blank, 1-199 lb.....	50
200 lb. and over:	
1/2 in. and smaller.....	62 1/2
9/16 to 1 in.....	60
1 1/8 in. and over.....	50

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds.....	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24.....	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BIRMINGHAM

Bars and bar shapes	\$3.85 base
Structural shapes and plates	3.75 "
Hot rolled sheets No. 10 ga.	3.80 "
Hot rolled sheets No. 24 ga.	4.40 " 3500 lb. and over
Galvanized sheets No. 24 ga.	5.05 " 3500 lb. or more
Strip	4.05 "
Reinforcing bars ..	3.85 "
Floor plates	5.96 "
Cold finished bars ..	4.91 "
Machine and car- riage bolts .....	.50 & 10 off list
Rivets (structural) \$4.60 base	
On plates, shapes, bars, hot rolled strip, heavy hot rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.	

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons.	3.16c.
Plates	3.90c.
Hot-rolled sheets, No. 10.....	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel.....	4.15c.
Checkered floor plates 1/4 in. and heavier	5.50c.
Galvanized sheets, No. 24, 100 bds. or more.....	\$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	\$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb. All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

	Base per Lb.
Mild steel bars.....	4.21c.
Iron bars	4.21c.
Reinforcing bars	4.21c.
Reinforcing shapes	4.11c.
Plates	4.11c.
Hot-rolled sheets No. 10.....	4.16c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*.....	4.76c.
Steel bands	4.41c.
Cold-finished bars	4.86c.

* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	4.31c.
Shapes, bar size.....	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10.....	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24.....	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	5.15c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list..	55

NEW ORLEANS

	Base per Lb.
Mild steel bars.....	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10.....	4.35c.
Steel bands	4.75c.
Cold-finished steel bars.....	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	\$3.55
Bolts and nuts, per cent off list	60

PACIFIC COAST

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars..	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports ..	2.975c.	2.975c.	2.975c.
Hot-rolled an- nealed sheets (No. 24)	5.15c.	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons..	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	\$3.40	\$3.20	\$3.40

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$54.00
First quality, New Jersey.....	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey....	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton.....	8.00

5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (East- ern)	9.50

5 per cent trade discount on silica brick.

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plym- outh Meeting and Chester....	\$49.00
Chemically bonded f.o.b. Balti- more, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester	\$69.00
Chemically bonded, f.o.b. Balti- more	59.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash	25.00

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.47
Delivered Newark or Jersey City	26.53
Delivered Philadelphia	25.84
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio.	25.75
Delivered Cincinnati	24.27
F.o.b. Duluth	24.50
F.o.b. Provo, Utah.	22.00
Delivered San Francisco, Los Angeles or Seattle.	26.50
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	\$25.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.61
Delivered Canton, Ohio.	24.89
Delivered Mansfield, Ohio.	25.44
F.o.b. Jackson, Ohio.	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	\$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.53
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago.	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.61
Delivered Canton, Ohio.	25.89
Delivered Mansfield, Ohio.	26.44

Low Phosphorus

Basing points: Birdsboro, Pa. Steelton, Pa., and Standish, N. Y.	\$28.50
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Gray Forge

Valley or Pittsburgh furnace.	\$23.50
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Charcoal

Lake Superior furnace.	\$27.00
Delivered Chicago	30.24

Canadian Pig Iron

Per Gross Ton	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.	\$26.50
No. 2 fdy., sil. 1.75 to 2.25.	25.50
Malleable	26.00
Basic	25.50
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.	\$27.50
No. 2 fdy., sil. 1.75 to 2.25.	27.00
Malleable	27.50
Basic	27.00

RAW MATERIALS PRICES

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Per Gross Ton	
Domestic, 80% (carload).	\$102.50

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size	
50% (carload lots, bulk).	\$69.50*
50% (ton lots in 50 gal. bbl.).	80.50*
75% (carload lots, bulk).	126.00*
75% (ton lots in 50 gal. bbl.).	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio Per Gross Ton	
10.00 to 10.50%	\$33.50
For each additional 0.50% silicon up to 17%.	
50c. per ton is added.	
Manganese 2 to 3%, \$1 per ton additional.	
For each unit of manganese over 3%, \$1 per ton additional.	
Phosphorus 0.75% or over, \$1 per ton additional.	
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	

Silvery Iron

Per Gross Ton	
F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$27.50
For each additional 0.5% silicon up to 17%.	
50c. a ton is added.	
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed.	
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	
Manganese, each unit over 3%, \$1 a ton additional.	
Phosphorus 0.75% or over, \$1 a ton additional.	

Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract	
4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract	
3% carbon	\$101.50*
2.50% carbon	106.50*
2% carbon	111.50*
1% carbon	121.50*

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally	\$2.00
Ferrotungsten, lots of 500 lbs., nominally	2.05
Ferrotungsten, smaller lots, nominally	2.10
Ferrovanadium, contract, per lb. contained V., delivered	\$2.70 to \$2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots.	\$2.25†
Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$142.50
Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton.	\$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	\$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville.	\$75.00
Ferromolybdenum, per lb. Mo.	95c.
Calcium molybdate, per lb. Mo f.o.b. furnace	80c.

*Spot prices are \$5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores Delivered Lower Lake Ports

Per Gross Ton	
Old range, Bessemer, 51.50%	\$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	\$4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.&F. Philadelphia or Baltimore Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal.	17.00c.
Iron, low phos., Swedish, average, 68½% iron nominally 17 to 18c.	
Iron, basic or foundry, Swedish, aver. 65% iron.	Nominally 16c.
Iron, basic or foundry, Russian, aver. 65% iron.	Nominal
Man., Caucasian, washed 52%	50c.
Man., African, Indian, 44-48%	45c.
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48½%	Nominal

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered.	\$23.50 to \$25.00
Tungsten, domestic, scheelite delivered	\$20.00 to \$25.00
Chrome ore (lump) c.i.f. Atlantic seaboard, per gross ton: South African (low grade)	\$16.00
Rhodesian, 45%	22.00
Rhodesian, 48%	25.50
Turkish, 48-49%	25.00 to \$26.00
Turkish, 45-46%	23.00 to 23.50
Turkish, 44%	19.00 to 19.50
Chrome concentrates (Turkish) c.i.f. Atlantic seaboard, per gross ton: 50%	\$25.50 to \$26.50
48-49%	24.50 to 25.00

FLUORSPAR

Per Net Ton	
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail.	\$20.00
Domestic, barge and rail.	21.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines.	22.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid.	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines.	31.50

FUEL OIL

Per Gal.	
F.o.b. Bayonne or Baltimore, No. 3 distillate.	5.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial.	5.25c.
Del'd Ch'go, No. 3 industrial.	4.15c.
Del'd Ch'go, No. 5 industrial.	4.00c.
Del'd Cleve'd, No. 3 distillate.	5.875c.
Del'd Cleve'd, No. 4 industrial.	5.75c.
Del'd Cleve'd, No. 5 industrial.	4.25c.

COKE

Per Net Ton	
Furnace, f.o.b. Connellsville, Prompt	\$4.00 to \$4.25
Foundry, f.o.b. Connellsville, Prompt	5.00 to 6.25
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England.	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	11.05
Foundry, by-product, delivered Cincinnati ..	10.50
Foundry, Birmingham ..	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

NIAGARA

BRAND

Ferro-Alloys

FERRO SILICON

ALL GRADES

FERRO CHROMIUM

HIGH CARBON

FERRO CHROMIUM

LOW CARBON

FERRO MANGANESE

SILICO MANGANESE

**PITTSBURGH METALLURGICAL
COMPANY, INCORPORATED**

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Sales Agents

Oglebay Norton & Co., Hanna Bldg., Cleveland, Ohio.
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Pittsburgh Metallurgical Co., Oliver Bldg., Pittsburgh, Pa.

REINFORCING STEEL

**... Awards of 6955 tons—
10,620 tons in new projects.**

AWARDS

Boston, 150 tons, Huntington Avenue subway, to W. Ames & Co., Jersey City, N. J.

North Providence, R. I., 114 tons, high school, to Concrete Steel Co., New York.

Pittsburgh, 350 tons, psychiatric hospital, to Sweets Steel Co., Williamsport, Pa.

Mount Lebanon, Pa., 200 tons, junior high school, to Jones & Laughlin Steel Corp., Pittsburgh, through Metzger-Richardson, Pittsburgh.

Bloomburg, Pa., 118 tons, State teachers college, to Milton Mfg. Co., Milton, Pa.

Morganza, Pa., 125 tons, State training school, to W. Ames & Co., Newark, N. J.

West Chester, Pa., 265 tons, Teachers College, to Consolidated Engineering Co., Baltimore.

Cleveland, 275 tons, general requirements for city, including Nottingham sewage plant work, to Kilroy Steel Co., Cleveland.

Charleston, W. Va., 285 tons, municipal auditorium, to West Virginia Rail Co., Huntington, W. Va.

Charleston, 275 tons, Elk River bridge, to West Virginia Rail Co.

Oklahoma City, Okla., 500 tons, municipal building, to Sheffield Steel Corp., Kansas City, Mo.

Detroit, 688 tons, Wayne County Road Commission, to Great Lakes Steel Corp., Detroit.

Hartford, Wis., 150 tons, high school addition, to W. H. Pipkorn Co., Milwaukee.

Springfield, Ill., 220 tons, livestock pavilion at State Fair Grounds, to Missouri Rolling Mills Corp., St. Louis.

McPherson, Kan., 150 tons, high school, to Sheffield Steel Corp., Kansas City.

Norton, Kan., 150 tons, hospital, to Sheffield Steel Corp., Kansas City.

Hickman Field, T. H., 120 tons, barracks and warehouse, to Bethlehem Steel Co., Los Angeles.

Odair, Wash., 1680 tons, for Grand Coulee project (Invitation 38499-A), to Columbia Steel Co., Denver, previously reported awarded to Soule Steel Co., San Francisco.

Olympia, Wash., 290 tons, State custodial school, to Bethlehem Steel Co., Seattle.

Seattle, 1050 tons, armory, to Bethlehem Steel Co., Seattle.

Sacramento, Cal., 181 tons, grandstand and building addition at Agricultural Park, to Soule Steel Co., San Francisco.

Knob, Cal., 1035 tons, for All-American Canal, to Bethlehem Steel Co.

Hennepin, Ill., 160 tons, bridge, to Bethlehem Steel Co.

Kalamazoo, Mich., 100 tons, Western State Teachers College, to Calumet Steel Co., Chicago.

NEW REINFORCING BAR PROJECTS

Boston, 400 tons, Massachusetts General Hospital unit.

Cambridge, Mass., 125 tons, Harvard University administration building.

Bristol, R. I., 100 tons, school.

New York, 300 tons, Procurement Division, Treasury Department, 150 tons on new inquiry and 150 tons for previous inquiry being readvertised.

New York, 650 tons, piers and end ramps, Bronx-Whitestone bridge, contract WB-6; bids by Triborough Bridge Authority until Feb. 9. Contract also calls for 4100 lineal ft. of piles.

Queens, N. Y., 450 tons, land section, Queens-Manhattan mid-town tunnel; bids until Feb. 24 by New York Tunnel Authority.

Auburn, N. Y., 150 tons, additions to prison; C. F. Haglin & Co., Buffalo, low bidder.

Philadelphia, 1500 tons, warehouses for Lit Brothers; bids Feb. 3.

Norristown, Pa., 300 tons, hospital; bids in.

Norfolk, Va., 265 tons, Navy Yard requisition.

Cincinnati, 181 tons, State highway.

Hamilton County, Ohio, 180 tons, State bridge; bids Feb. 8.

Chicago, 100 tons, Monroe Street garage.

East Chicago, 100 tons, sewage plant.

Madison, Wis., 100 tons, Stephen Lee apartment building.

Green Bay, Wis., 200 tons, hydroelectric power plant for Wisconsin Public Service Corp. at Merrill, Wis.; bids Feb. 7.

Madison, Wis., 350 tons, addition to University of Wisconsin Memorial Union building; bids soon.

Jefferson City, Mo., 100 tons, power house for State prison.

Clarksville, Mo., 570 tons, Missouri River bridge; bids postponed to Feb. 18.

Mineral Wells, Tex., 4500 tons, Possum Kingdom dam; bids Feb. 24. Piling extra.

Chicago, 670 tons, apartment building; bids in.

Hilo, T. H., 100 tons, Keawe Wailuku bridge.

Steel Inventories at Mills 7.5% Under a Year Ago

THE steel industry entered 1938 with inventories of semi-finished and finished steel about 7.5 per cent lower than a year earlier, according to reports to the American Iron and Steel Institute from representative steel companies.

Inventories of some raw materials for steel-making, however, were reported to be above the levels of the year before, largely because substantial tonnages of those materials were accumulated before steel operations dropped late in 1937.

Stocks of iron ore on docks or at the blast furnaces on Dec. 31, 1937, were about 30 per cent higher than a

year before, while the 1937 year-end inventories of purchased scrap steel showed an advance of about 45 per cent.

Supply of coal on hand as 1937 ended, however, was nearly 10 per cent below the preceding year. Year-end inventories of ferro-alloys showed a drop of 3 per cent as compared with inventories on Dec. 31, 1936.

Tonnage of pig iron on hand at the end of 1937 was approximately 65 per cent greater than at the close of 1936.

Non-ferrous metal inventories of the steel industry increased 40 per cent in the aggregate during 1937.

Rail Equipment Exports Up 77 Per Cent in 1937

WASHINGTON—Exports of railway equipment from the United States during 1937 were valued at \$12,917,387, an increase of 77 per cent compared with exports valued at \$7,296,648 during 1936, according to preliminary statistics made public by the Transportation Division, Department of Commerce.

Senate Opens Probe Of "Strategic" Materials

THE Senate Military Affairs Committee was scheduled to start its investigation covering "strategic raw materials" on Feb. 4. The public

hearings on the pending scrap licensing bills will be called at the completion of the investigation. Army, Navy and State Department experts are expected to be the first called before the committee.

\$50,000,000 Borrowed For U. S. Steel Construction

THE United States Steel Corp. on Tuesday announced that it had borrowed from banks in New York, Chicago and Pittsburgh a total of \$50,000,000 maturing in one, two and three years. The Corporation has arranged for these loans in anticipation of substantial outlays to be required for new construction work now under way.

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... Order level is low, but inquiries are in good volume.

... Several railroad budgets look promising. Norge has \$2,000,000 expansion program.

... National Defense program should help equipment makers.

Domestic Orders Hold Level; Inquiries Up at Cincinnati

CINCINNATI—While optimism toward the future is still strong, current machinery demand lacks substantial background. No lessening of orders from previous levels is noted, but foreign business is still more active than domestic. Analysis of orders from American sources, however, reflects an apparent wide interest in retooling, but consumers are retrenching in the face of general business conditions. Inquiry is brisk, and quotations on a large number of requests are still considered current. Drilling machinery is without much demand, but lathes and millers are prominent in current purchases.

Factories are overtaking backlogs, and production rates are easing. Current schedules indicate average operations under 50 per cent.

Ford Beginning to Buy Lathes for Consolidated Tool Shop

CLEVELAND—Developments during the last few days indicate that the long-awaited equipment program of Ford Motor Co. may start off with an initial purchase of 14 lathes. Sellers still have no definite idea as to just when the purchase may be made, as it is understood the automotive manufacturer contemplates trading in 14 old lathes, which is likely to result in a period of negotiation with dealers. Sales of miscellaneous small tools continue active in this district. Among the orders booked recently were three electric buffers for a tire producer, a fair-sized drill grinder and a number of other single tools, for immediate use. The volume of inquiry is good, but very little of this is being turned into actual sales, especially in the larger tools.

Norge to Spend \$2,000,000 on Expansion Program

DETROIT—Metal working plants of the Borg-Warner Corp.'s Norge division will benefit from a \$2,000,000 expansion program announced last week; \$1,200,000 will be spent to enlarge the Detroit factory, and \$800,000 will be spent on the Muskegon plant. Tool and die shops in the Detroit area have been told indirectly that they will benefit from the bigger-than-usual program of the

Fisher Body Division of General Motors. This unit generally handles most of its own work, but an overflow is anticipated, and inquiries should be out shortly. So far as can be determined, only the Buick fender dies are being worked at present; a Toledo plant has the job. Sale of 15 thread grinders and 53 diamond boring machines to foreign interests have been reported in this area recently.

The end of this week or early next week will see the first request from Nash Kelvinator Corp. for tool and die estimates on the 1939 Nash models. It is anticipated that this will amount to about \$2,000,000.

Small Tool Sales 20% of Normal in Chicago

CHICAGO—Machine tool sellers still retain considerable optimism, though January sales as a whole showed an unimpressive total, and prospects for increased business over the next two or three months are none too favorable. The main disturbing factor at the moment is the condition of small tool sales, which are running about 20 per cent of normal. Since this phase of the business is generally regarded as an indicator of the machine tool situation a few months hence, and since a pick-up in small tools usually precedes a rise in orders for heavier equipment, it is readily seen that cause for uncertainty exists, even though such a feeling is not widespread. The Burlington Railroad is planning improvements and expansion of its Burlington, Iowa, shops at an estimated cost of \$1,000,000. It is understood, however, that this project may depend a great deal on the action of the Interstate Commerce Commission with regard to freight rate advances. The Santa Fe is inquiring for a motor-driven grinder and a radial drill.

Defense Program Will Aid Metropolitan Dealers

NEW YORK—The President's message on National Defense came at a time when dealers and factory representatives were actively engaged in figuring various projects involving Army or Navy work. A leading railroad equipment manufacturer has been taking figures on machinery for machining 9-in. shells, presumably in case this firm should be awarded an "educational order" for shells. This particular company figured prominently as

a shell maker during the World War, but managed to sell all its special shell-making equipment before the last shell order was released. The Brooklyn Navy yard is reviving a project under consideration two years ago of making turbine buckets and other turbine components at the yard. The Philadelphia Navy yard has been in the market several times since the first of the year, the last purchase being a large plate planer for armor plate for the battleship shortly to be constructed there. Sperry Gyroscope Co., prominent Navy supplier, also has bought a number of machine tools in the recent past.

Makers of large equipment, while enjoying good business from Russian sources principally, look to revived buying on the part of the railroads as soon as favorable action on rate increases is given by the ICC. Shipyards stand to benefit by contemplated merchant marine and Navy programs, but have been conspicuously absent from the machinery market for years. Eastern steel mills have been in the same category, as far as heavy machine tools are concerned.

Inquiries from general industrial centers are being received in volume, and the outlook is favorable. Most dealers reported new orders in January at a low level, about on a par with the December volume, which suffered from an almost complete absence of orders during the last half of the month.

Missouri-Pacific \$138,000 Tool Budget Approved

ST. LOUIS—The 1938 budget of the Missouri Pacific Railway, as approved by the Federal Court at St. Louis, includes \$137,980 for machine tools, as follows: One lye vat, pillar crane and baskets for cleaning parts of locomotives, \$7500; one flat turret lathe for 4-in. bar stock, \$5430; one nickel-chromium plating outfit, \$1100; 10 400-amp. portable electric welding machines at \$850 each, \$8500; one 400-amp. portable electric welding machine, \$1200; six motor-driven hacksaws, \$4200; one automatic spacing table, \$2700; one motor-driven grinder, \$430; one 20-in. engine lathe, \$4500; one armature undercutting machine, \$200; one heavy-duty axle turning lathe, \$9490; one flexible sanding machine, \$800; one automatic knife grinder, \$420; one metal-cutting band saw, \$1200; one 10-hp. blower, \$400; one 12 x 12-in. double grinder, \$240; one 20-in. engine lathe, \$4550; one "A" frame hoist, \$620; one heavy-duty power-operated brake, \$14,600; one heavy-duty power-operated shear, \$11,900; one boring mill and five-ton crane, \$30,490; one motor-driven woodworking shaper, \$1600; one 30-in. heavy-duty engine lathe, \$2840; one 12 x 2-in. double grinder, \$220; one "AB" triple valve test rack, \$950; one 4-ft. radial drill, \$5650; one sensitive drill press up to 5/8-in. capacity, \$555; one 24 x 3-in. double grinder, \$865; one motorized planer and bolt threader, \$630; one motor driven portable engine mover, \$2400; one Universal woodworking machine, \$680; one 43-in. boring mill, \$760; one 4-ft. radial drill, \$1570, and one 30-in. engine lathe, \$5200. The budget also includes the following machine tools for subsidiaries: Missouri Pacific Corp. in Nebraska, one motor-driven grinder, \$230; Missouri and Illinois Railway, one 400-amp. welding machine, \$850.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Leindorf Bus & Truck Corp., Woodside, New York, has leased one-story industrial building at Thirty-fourth Avenue and Sixty-fourth Street, about 35,000 sq. ft. of floor space, for new assembling works.

General Manager, Port of New York Authority, 111 Eighth Avenue, New York, asks bids until Feb. 15 for mechanical fans, motors and transmission equipment for north tube of new Lincoln Tunnel. Plans and specifications at office of assistant chief engineer, room 1537, address noted.

Board of Education, Glen Cove, L. I., plans installation of manual training equipment in new three-story high school, for which general contract has just been let to Andrew Weston Co., 7 East Forty-second Street, New York. Cost about \$615,000, exclusive of equipment. Tooker & Marsh, 101 Park Avenue, New York, are architects.

Nicholson & Gal'oway, Inc., 646 Hudson Street, New York, manufacturer of metal roofing, has leased building at 426-28 East 110th Street for new plant, removing from present location and increasing capacity.

Borden's Farm Products Co., 110 Hudson Street, New York, plans extensions and improvements in mechanical-bottling plant at 80-82 Third Avenue, Brooklyn, including additional equipment. Cost close to \$45,000.

National Hardware Co., 2103 Pitkin Avenue, Brooklyn, hardware specialties, has filed plans for new one-story plant, 100 x 127 ft., at 130th Street and Ninety-first Avenue, Richmond Hill district. Cost over \$35,000 with equipment.

Central Roofing & Sheet Metal Works, Bronx, New York, has leased space in building at 626 Courtland Avenue for new plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 8 for copper-nickel alloy condenser tubes (Schedule 2687), refrigerating plants for air-conditioning and air-cooling, including spare parts (Schedule 2655), magnet wire (Schedule 2647) for Brooklyn Navy Yard; steel hexagon nuts (Schedule 2692) for Brooklyn and Philadelphia yards; insulated electric cable and cord (Schedule 2656) for Brooklyn and Mare Island yards; until Feb. 15, 3500 galvanized iron or steel wire rope clips (Schedule 2695) for Brooklyn and Sewalls Point yards.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Feb. 18 for 192,205 ft. of wire and 123 reels (Circular 116).

General Electric Vapor Lamp Co., 410 Eighth Street, Hoboken, N. J., has plans for two-story addition. Cost over \$65,000 with equipment. Lockwood Greene Engineers, Inc., 30 Rockefeller Plaza, New York, is architect and engineer.

E. I. duPont de Nemours & Co., Wilmington, Del., plan rebuilding part of synthetic rubber plant at Deep Water, N. J., recently destroyed by fire. Loss about \$100,000 with equipment.

Superintendent of Lighthouses, St. George, Staten Island, New York, asks bids until Feb. 8 for 100 acetylene flashing mechanisms (Proposal 55819); until Feb. 9, 100 acetylene cylinders, each with capacity of 1060 cu. ft. (Proposal 55832).

Quaker Bottling Co., 935 North Seventh Street, Philadelphia, has acquired a three-story building at 142-48 Green Lane, 30,000 sq. ft. of floor space, and will improve for new plant unit.

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until Feb. 8 for aluminum-alloy, heat-treated, loop-type bonding clips without tabs, and similar clips with tabs; bronze, loop-type bonding clips

without tabs, and similar clips with tabs (Aero Req. 954).

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Feb. 8 for four 27 cu. ft. double-side steel dump trucks, with roller bearing wheels (Circular 658); gages, plain rings, snap, flush pin, twin pin, plain plug, thread ring, etc. (Circular 660); reworking bullets, scrap zinc, cupro nickel scrap, etc., into 90,000 lb. of lead antimony alloy (Circular 657); 130 hobs, unground form, used to cut threads on heat-treated projectiles made from forged steel (Circular 654); until Feb. 9, two conveyors for annealing room, small arms ammunition department (Circular 646), one high-speed staking machine with all equipment (Circular 646), one high-speed staking machine with all equipment (Circular 663), 18,000 annealed 70/30 cartridge brass blanks (Circular 665).

◀ BUFFALO DISTRICT ▶

Rochester Brewing Co., 770 Emerson Street, Rochester, N. Y., has let general contract to John B. Pike & Son, Inc., 1 Circle Street, for three-story and basement addition for new brew-house unit and other operating divisions. Cost over \$75,000 with equipment. Frank M. Quinlan, 141 Normandy Avenue, is architect.

Central School District, Springwater, N. Y., plans manual training equipment in new two-story central school, for which bids will be asked on general contract in spring. Cost about \$240,000. Financing has been arranged through Federal aid. Harbach & Kideney, 505 Franklin Street, Buffalo, are architects.

Syracuse Supply Co., 314 West Fayette Street, Syracuse, N. Y., machinery and other mechanical equipment, plans new one-story storage and distributing plant. Cost close to \$45,000 with equipment. Guy L. Noble, 313 Highland Avenue, is architect and engineer.

◀ WASHINGTON DIST. ▶

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until Feb. 7 for 80,000 machine screws, 80,000 nuts and 80,000 lock washers (Circular 223); until Feb. 9, 3500 lb. of flat nail-less steel strapping and 10,000 lb. of metal strapping seals (Circular 234).

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 8 for steel machine bolts, steel carriage bolts, brass bolts, brass expansion bolts, steel machine screws, steel lag screws, steel nuts, steel rivets, brass nuts, brass rivets, iron or steel plate washers, lock washers, malleable iron pipe fittings, brass or bronze pipe fittings, brass or bronze unions, galvanized flanged unions, galvanized iron or steel pipe straps, malleable iron galvanized railing fittings, gate valves, globe valves, check valves, pressure reducing valves, bibb cocks, steam hose couplings and other equipment (Schedule 3327); until Feb. 11, parts for dipper teeth, manganese steel, for 15-yd. dipper dredges, brass machine screws, brass wood screws, brass plate washers, galvanized coil chain, weldless chain, chain links, chain bolts and other equipment (Schedule 3329).

Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, is arranging fund of \$5,400,000 for expansion and improvements in power plants and system, including equipment, transmission and distributing lines, power substations, switching stations, and other structures.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 8 for steel rivets and washers (Schedule 2663), 147,300 lb. of cast steel chain (Schedule 2643), burrs, rivets and washers (Schedule 2671), close-link weldless coil chain (Schedule 2649), steel valves, welding ends

(Schedule 2700); until Feb. 15, nails, brads, tacks and spikes (Schedule 2676), bolts, screw eyes, brackets, catches, grommets, etc. (Schedule 2703) for Eastern and Western yards; until Feb. 8, steel valves (Schedule 2719) for Norfolk, Va., Navy Yard; four steel tanks, 4½ x 24 ft., and two acid-mixing tanks, 8 x 30 ft. (Schedule 2668) for White Plains station; four shaft transmitters, 12 master indicators, two frequency control units, two rotary converters and spare parts (Schedule 2694) for Portsmouth yard; until Feb. 11, 49 clockwise rotation inertia starters (Schedule 2715) for Baltimore and Philadelphia yards.

◀ NEW ENGLAND ▶

American Brass Co., Waterbury, Conn., has approved plans for one-story addition to plant at Torrington, Conn., 40 x 120 ft. Cost over \$40,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 15 for bus transfer equipments and spare parts for Boston, Charleston and Puget Sound Navy yards (Schedule 2720).

Boston Edison Co., 182 Tremont Street, Boston, has let general contract to Thomas O'Connor Co., 238 Main Street, Cambridge, Mass., for extensions and improvements in steam-electric power plant at Weymouth, Mass. Cost over \$250,000 with equipment. Jackson & Moreland, 31 St. James Avenue, Boston, are consulting engineers.

Board of Education, Rochester, N. H., plans manual training equipment in new three-story and basement Spaulding high school, for which bids are being asked on general contract until Feb. 8. Cost about \$800,000. C. R. Whiteher, 814 Elm Street, Manchester, N. H., is architect.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Feb. 8 for 12 high-speed steel T-cutters, six sets of high-speed steel cutters, 12 hollow mills, 20 sets of high-speed steel cutters, 12 shank cutters, two mill cutters and one set of mill cutters (Circular 147); until Feb. 11, one gas-fired air-tempering furnace (Circular 143).

◀ SOUTH ATLANTIC ▶

LaGrange Coca-Cola Bottling Co., LaGrange, Ga., will take bids soon on general contract for two-story and basement mechanical-bottling plant. Cost close to \$50,000 with equipment. O. C. Poundstone, Palmer Building, Atlanta, Ga., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 8 for 20 aircraft propeller blades (Schedule 2699) for Naval Air Station, Pensacola, Fla.

L. B. Kendall, S.W. Eighth Street and Sixty-ninth Avenue, Miami, Fla., has plans for new fruit-packing plant, one-story, 35 x 80 ft., with one-story wing extension, 30 x 30 ft. Cost about \$45,000 with conveyors, loaders and other mechanical-handling equipment. Carl H. Blohm, Theater Building, Coral Gables, Fla., is architect.

◀ SOUTH CENTRAL ▶

Ashland Oil & Refining Co., Ashland, Ky., plans addition to Leach oil refinery, to be used as a skimming plant. Plans also are under way for new bulk river terminals at Maysville and Covington, Ky., including steel tanks, pumping stations and other facilities. Entire project will cost about \$175,000 with equipment.

United States Engineer Office, Louisville, asks bids until Feb. 25 for cast steel protection angles, reinforcing steel, bolts and steel parts for raising crest elevations of dams Nos. 47, 51, 52 and 53, Ohio River.

City Council, Decatur, Ala., will take bids soon for municipal electrical distributing system, including wire and cable, power substation and service facilities, etc. Fund of \$360,000 has been arranged through Federal aid.

United States Engineer Office, First District, New Orleans, asks bids until Feb. 7

for one concrete mixer, 10-cu. ft. capacity (Circular 201).

City Council, Starkville, Miss., has plans for new municipal electric power plant. Cost about \$111,000. Financing has been arranged through Federal grant and loan. A. S. Brumby, Starkville, is engineer.

United States Engineer Office, Vicksburg, Miss., asks bids until Feb. 7 for one motor-driven centrifugal pump (Circular 187); until Feb. 11, cast bronze bushings, cast solid bronze rounds, cast solid bronze squares and cast solid bronze hexagons (Circular 185).

◀ SOUTHWEST ▶

Hu'l-Dillon Co., Pittsburg, Kan., meat packer, will take bids soon on general contract for extensions and improvements, including one-story units. Cost over \$50,000 with equipment. Daniel R. Sandford, Wilhoit Building, Springfield, Mo., is architect.

Oklahoma Gas & Electric Co., Oklahoma City, has arranged fund of \$2,861,000 for expansion and improvements in power plants and system, including equipment, transmission and distributing lines, power substations, switching stations and other structures.

State Highway Commission, State House, Jefferson City, Mo., has let general contract to Bennett Construction Co., Telephone Building, St. Louis, for one-story repair and maintenance shop, 36 x 103 ft., for road equipment, motor trucks and cars, at Nevada, Mo. Cost about \$40,000 with equipment. Similar shops will be built at Harrisonville and Monett, Mo., each one-story, 36 x 76 ft. C. W. Brown is chief engineer.

Brazos River Conservation and Reclamation District, Kyle Hotel Building, Temple, Tex., asks bids until Feb. 24 for equipment for Possum Kingdom power dam near Mineral Wells, Tex., including one 80-ton power house crane, span 43 ft. 5 in.; one motor-driven centrifugal pumping unit with accessories; one air compressor; nine steel roller gates, 3 ft. 2 in. x 6 ft., with hoists; one steel roller gate, 12 x 16 ft., with hoist; two motor-operated butterfly valves, 12-ft. dia.; one high-pressure gate valve, 60-in. dia.; one cylinder valve, 54-in. dia.; 50 gate and check valves up to 24-in. and pipe; one trash rack with hoisting mechanism. Ambursen Engineering Corp., 295 Madison Avenue, New York, is consulting engineer. John A. Norris is chief engineer and general manager.

Texas Sea Foods, Inc., National Standard Building, Houston, Tex., canner and packer of food products, has plans for new three-story branch plant at Corpus Christi, Tex., for which bids will be asked soon on general contract. Cost over \$50,000 with equipment. Henry S. Hoddman, 3908 Main Street, Houston, is architect.

City Council, Liberty, Tex., will take bids soon for three 150-kw. diesel engine-generator units and accessories for new municipal electric power plant. Cost about \$95,000. Garrett Engineering Co., Houston, Tex., is consulting engineer.

Mound Tool Co., 1203 South Seventh Street, St. Louis, has purchased adjoining three-story building for expansion.

◀ WESTERN PA. DIST. ▶

Gulf Oil Corp., Gulf Building, Pittsburgh, has approved plans for expansion and improvements in oil and gasoline departments in refining plant at Port Arthur, Tex., including buildings and equipment. Additions also will be made to steel tank storage facilities. Cost over \$1,000,000 with equipment.

United States Engineer Office, Huntington, W. Va., asks bids until Feb. 9 for two motor-driven tow-haulage units, complete and delivered ready for installation (Circular 83); until Feb. 11 for one steam-driven, double cylinder, single-drum hoisting engine (Circular 84).

Aluminum Co. of America, Inc., Gulf Building, Pittsburgh, has let structural steel award to Virginia Bridge Co., Roanoke, Va., for one-story addition to branch plant at Mobile, Ala. Cost over \$100,000 with equipment.

◀ OHIO AND INDIANA ▶

Cedar Valley Distillery Co., Wooster, Ohio, plans one-story mechanical-bottling unit. Cost over \$50,000 with equipment.

Columbus & Southern Ohio Electric Co., Columbus, Ohio, has arranged fund of about \$5,000,000 for expansion and improvements in main steam-electric generating station, to include installation of turbo-generator units, high-pressure boilers, pumps and auxiliary equipment; also extensions in transmission and distributing lines.

Franklin Brewery Co., 117 North Sandusky Street, Columbus, Ohio, will ask bids soon on general contract for one-story and basement mechanical-bottling works addition, 60 x 145 ft. Cost over \$50,000 with equipment. Charles Cloud, 203 East Broad Street, is architect.

Contracting Officer, Materiel Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Feb. 7 for seamless steel tubing, chrome molybdenum (Circular 631); cylinder barrels, valve rockers, piston rings, oil rings, piston pins, rocker rollers, packing ring sleeves, rocker roller hub and gasket (Circular 619); until Feb. 8, 10 oil pump assemblies, five engine-driven, hydraulic pump assemblies (Circular 636), aircraft and clevis bolts, eye bolts, castle nuts, check, plain and conduit nuts, lock, flat head and taper pins, ball socket washers, steel, plain and threaded taper pin washers (Circular 603); until Feb. 9, parkway steel tape armored cable and rubber-insulated lead-covered cable (Circular 624), socket wrench bars and socket wrench handles (Circular 629); until Feb. 10, strain measuring equipment (Circular 577), 14 automatic pilot remote control adapter assemblies; until Feb. 14, 16,000 ft. 1/4-in. hose clamps, and 13,000 ft. of 1/2-in. hose clamps (Circular 639).

Haynes-Stellite Co., Kokomo, Ind., tools, alloys, etc., will take bids soon for two-story addition, 75 x 132 ft. Cost over \$75,000 with equipment. Charles Ammerman, Century Building, Indianapolis, is mechanical engineer.

◀ MICHIGAN DISTRICT ▶

Bohn Aluminum & Brass Co., Lafayette Building, Detroit, aluminum, brass and bronze castings and forgings, will take bids about Feb. 15 on general contract for one-story foundry, 100 x 185 ft., and boiler house 35 x 35 ft., at Adrian, Mich., for which revised plans are being drawn.

City Council, Traverse City, Mich., plans extensions and improvements in municipal electric power plant, including additional equipment, work to begin early in spring. Cost about \$65,000. Hamilton & Weeber, Grand Rapids, Mich., are consulting engineers.

Roycroft Coach Co., Chesaning, Mich., manufacturer of motor trailers and parts, plans rebuilding part of plant recently destroyed by fire. Loss about \$40,000 with equipment.

Great Lakes Screen & Weatherstrip Co., 15763 Livernois Avenue, Detroit, wire screens, metal weatherstrips, etc., has plans for two-story addition. Cost close to \$40,000 with equipment.

City Council, Kalamazoo, Mich., has plans for extensions and improvements in municipal electric power plant, including multi-story addition and installation of equipment. Cost about \$270,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

◀ MIDDLE WEST ▶

Barnes Drill Co., 814 Chestnut Street, Rockford, Ill., has let general contract to E. W. Schmeling & Sons, Inc., 1031 School Street, for two-story addition, 28 x 60 ft. Cost over \$40,000 with equipment. Arthur Eliel is company architect.

City Council, St. Charles, Ill., plans steam-electric generating plant in connection with new city hall. Fund of \$100,000 has been arranged for entire project. R. Harold Zook, 140 South Dearborn Street, Chicago, is architect.

State Board of Education, State House, Des

Moines, Iowa, M. R. Pierson, secretary, asks bids until Feb. 9 for steam generating equipment and auxiliaries for power house at Iowa State College, Ames, Iowa. Cost about \$135,000. Superintendent of Department of Buildings, Grounds and Construction, Iowa State College, Ames, is in charge. Commercial Testing & Engineering Co., 307 North Michigan Avenue, Chicago, is consulting engineer.

Johnson Implement Co., Kennedy, Minn., manufacturer of farm implements and equipment, plans rebuilding part of plant recently destroyed by fire. Loss close to \$50,000 with equipment.

Bureau of Reclamation, Denver, asks bids until Feb. 8 for one gasoline engine-driven electric generator set (Proposal A-42477-A); until Feb. 10, two 3000-lb. radial gate hoists for Leasburg Canal sluiceway, Rio Grande project, New Mexico-Texas; and one 10,000-lb. radial gate hoist for siphon drop power plant, Yuma project, Arizona-California (Specifications 1029-D).

Minnesota Mining & Mfg. Co., 791 Forest Street, St. Paul, Minn., manufacturer of abrasive products, has begun superstructure for three-story addition, 150 x 300 ft., for which general contract recently was let to William M. Murphy & Son, New York Building. Cost about \$400,000 with equipment. Toltz, King & Day, Inc., Pioneer Building, is architect and engineer.

City Council, Lincoln, Neb., plans extensions and improvements in municipal electric power plant, including additional equipment. Cost about \$175,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers; D. L. Erickson is city engineer.

Broadmoor Hotel Co., Colorado Springs, Colo., Spencer Penrose, head, has plans for new cable tramway for passenger transportation from Windy Point to summit of Pike's Peak, about two miles. Milton J. Strick, Broadmoor Hotel, will supervise installation.

◀ PACIFIC COAST ▶

Bureau of Yards and Docks, Navy Department, Washington, asks bids until March 9 for power-operated capstans for Mare Island Navy Yard (Specifications 8515).

Bureau of Water and Power, 207 South Broadway, Los Angeles, plans new three-story electrical and mechanical repair shop, 120 x 180 ft., at 1630 North Main Street. Cost close to \$400,000 with equipment. Plans also are under way for one-story transportation building, 25 x 200 ft., at same location. Cost \$113,000 with equipment.

Seattle Oxygen Co., 908 Post Street, Seattle, industrial oxygen, hydrogen, etc., has filed plans for new one-story plant, 60 x 130 ft., to include a bottling division. Cost close to \$35,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 11 for two motor-driven milling machines (Schedules 2696 and 2697), spare parts for airplanes (Schedules 900-1453 and 900-1454), soldering clevis for airplanes (Schedule 900-1455) for San Diego Naval Air Station; one 16,000-lb. crane ladle (Schedule 2701); until Feb. 15, 100 225 cu. ft. each acetylene gas cylinders (Schedule 2717) for Mare Island yard.

Grace Brothers Brewery, Inc., 671 South Rio Street, Los Angeles, has plans for one-story addition, 40 x 117 ft., primarily for storage and distribution. Cost about \$35,000 with equipment. Arlos R. Sedgley, 910 North Serrano Avenue, is architect.

City Council, St. Anthony, Idaho, plans municipal hydroelectric generating plant on Henrys Fork of Snake River, including power dam, generating station, transmission line to municipal limits, power substation and distribution facilities. Cost about \$165,000.

Bureau of Reclamation, Denver, asks bids until Feb. 10 for line hardware and conductor fittings for 230-kv. switchyard at Boulder power plant, Boulder Canyon project (Specifications 1026-D); until Feb. 11, one pumping unit and accessories for Cuecor Creek pumping station No. 2, Owyhee project, Oregon-Idaho (Specifications 1025-D).

FABRICATED STEEL

... Lettings advance to 18,400 tons from 12,550 tons last week.

o o o

... New projects higher at 10,600 tons.

o o o

... Plate awards total 9075 tons.

NORTH ATLANTIC STATES

New York, 1500 tons, hangar, North Beach airport, to Bethlehem Steel Co., Bethlehem, Pa.

New York, 960 tons, express highway ramps, New York Central Railroad, to Bethlehem Steel Co., Bethlehem, Pa.

New York, 6000 tons, Rockefeller Center building No. 7, to Bethlehem Steel Co., Bethlehem, Pa.

Riverhead, N. Y., 350 tons, State bridge to Bethlehem Steel Co.

State of New Jersey, 150 tons, three State bridges, to American Bridge Co., Pittsburgh.

Weehawken, N. J., 245 tons, approach to Lincoln Tunnel, to American Bridge Co., Pittsburgh.

Madison, N. J., 325 tons, Drew University library, to Keystone Steel Co., Philadelphia.

Shippensburg, Pa., 185 tons, Teachers College buildings, to Reading Steel Products Co., Reading, Pa.

Baltimore, 125 tons, Morgan College library, to Dietrich Brothers, Baltimore.

THE SOUTH

Sweetwater, Tenn., 1350 tons, transmission towers, Tennessee Valley Authority, to American Bridge Co., Pittsburgh.

Gonzales County, Tex., 150 tons, bridge, to North Texas Iron & Steel Co., Fort Worth, Tex.

Holdenville, Okla., 200 tons, gin building and seed house to Larrence Tank Corp., Lawton, Okla.

Baton Rouge, La., 150 tons, Alcoa Products building, to Decatur Iron & Steel Co., Decatur, Ala.

CENTRAL STATES

Detroit, 245 tons, addition to Pfeiffer Brewing plant, to R. C. Mahon Co., Detroit.

Cleveland, 300 tons, Cuyahoga Heights, Ohio, school building, to Kilroy Structural Steel Co.

Akron, Ohio, 212 tons, East Market Street bridge over Baltimore & Ohio tracks, to Bethlehem Steel Co., Bethlehem, Pa.

Alsip, Ill., 545 tons, Cicero Avenue bridge, to Wisconsin Bridge & Iron Co., Milwaukee.

Hennepin, Ill., 1832 tons, State bridge, to Bethlehem Steel Co., Bethlehem, Pa.

St. Charles, Mo., 900 tons, repair to highway bridge across Missouri River, to Fort Pitt Bridge Works Co., Pittsburgh.

Moberly, Mo., 250 tons, highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.

Booneville, Mo., 150 tons, highway bridge, to Reliance Steel Co., Pittsburgh.

Monroe County, Ill., 120 tons, highway bridge, to Wendnagel & Co., Chicago.

Chicago, 530 tons, Sag Channel bridge, to Wisconsin Bridge & Iron Co., Milwaukee.

WESTERN STATES

Los Angeles, 100 tons, Armstrong Cork Co. plant, to Western Iron & Metal Co., Los Angeles.

Sanger, Cal., 108 tons, State highway bridge, to Minneapolis-Moline Power Implement Co., Minneapolis, Minn.

Oakland, Cal., about 850 tons, Owens-Illinois Glass Co. plant addition, to Moore Dry Dock Co., Oakland, Cal.

Seattle, 565 tons, armory, to Isaacson Iron Works, Seattle.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Boston, 1500 tons, Massachusetts General Hospital unit.

Cambridge, Mass., 450 tons, building, Harvard University.

Rochester, N. H., 600 tons, high school.

New York, 120 tons, building, City Island Boat Building Co.

New York, 200 tons, building addition, St. James Episcopal Church.

New York, 350 tons, addition to public school No. 89 in Bronx; bids close Feb. 8.

Queens, N. Y., 4500 tons, land section contract No. 7, Queens-Manhattan tunnel; bids close Feb. 24, New York Tunnel Authority.

Queens, N. Y., 300 tons, addition to public school No. 32; bids close Feb. 8.

Hastings-on-Hudson, N. Y., 120 tons, mill building and crane runway, Anaconda Copper Mining Co.

Westhampton Beach, N. Y., 280 tons, high school building.

Philadelphia, 1000 tons, warehouses for Lit Brothers.

Cynwyd, Pa., 230 tons, junior high school building.

Edinboro, Pa., 300 tons, building, State Teachers College; bids Feb. 3.

Millersville, Pa., 200 tons, teachers college; bids Feb. 3.

Pennhurst, Pa., 300 tons, institution building; bids Feb. 7.

Stroudsburg, Pa., 250 tons, institution building; bids Feb. 7.

Scranton, Pa., 500 tons, hospital, bids Feb. 11.

Washington, 750 tons, operations and engineering hangars, Government Air Corps.

THE SOUTH

Louisville, Ky., 1000 tons, wickets, horses, etc., for Ohio River dams 47, 51, 52 and 53, United States Engineer's Office.

Jacksonville, Fla., 3400 tons, St. Johns River bridge; bids soon.

Austin, Tex., 200 tons, Kress store.

CENTRAL STATES

Hamilton County, Ohio, 420 tons, State bridge; bids Feb. 8.

Toledo, 300 tons, Fassett Street bridge; revised bids Feb. 15.

Sandusky, Ohio, 1000 tons, power house.

Middletown, Ohio, 1200 tons, annealing shop, American Rolling Mill Co.

Sioux City, Iowa, Missouri River bridge, to require 3000 tons; abandoned.

Jefferson City, Mo., 250 tons, power house for State prison.

Clarksville, Mo., 4300 tons, Missouri River dam; bids postponed to Feb. 18.

WESTERN STATES

Climax, Colo., 230 tons, beams, Climax Molybdenum Co.

Tiburon, Cal., 200 tons, freight apron, Northwestern Pacific Railroad.

San Francisco, 380 tons, roadway on Yerba Buena Island for United States Engineer; Heafey Moore Co. and Frederickson & Watson Construction Co., Oakland, Cal., joint low bidders on general contract.

Honolulu, T. H., 280 tons, freight transport shed.

FABRICATED PLATES

AWARDS

Cleveland, 800 tons, Hauserman Road water main, to American Rolling Mill Co., Middletown, Ohio.

Grand Coulee Dam, 8275 tons, penstocks, to Western Pipe & Steel Co., San Francisco.

NEW PROJECTS

St. Louis, tonnage undetermined, 20 barges for Federal Barge Line; bids Feb. 21.

Coulee City, Wash., about 150 tons, 30 bulkhead gates for Grand Coulee project; bids Feb. 9.

SHEET PILING

NEW PROJECTS

St. Louis, 370 tons, Board of Public Service for Maline Creek channel.

Canada and U. S. Trade Pact Hearings Set for April 4

WASHINGTON.—Announcing its intention of negotiating a new reciprocal trade agreement with Canada, the State Department through its Committee for Reciprocity Information has fixed April 4 for public hearings on the contemplated agreement which will replace and broaden the one which has been in effect for the last two years. Interested parties may also submit their views in writing, the Department said, prior to March 12.

Among products on which the Department will consider granting tariff concessions are:

Ferromanganese containing not less than 4 per cent of carbon; present rate of duty 1c. per lb. on the metallic manganese content;

Ferromanganese containing not less than 1 per cent carbon; present rate, 17½c. per lb. on the manganese content and 15 per cent;

Ferrosilicon, containing 8 per cent or more silicon and less than 30 per cent; present rate, 1½c. per lb. on the silicon content;

Ferrosilicon, containing 30 per cent or more of silicon and less than 60 per cent; present duty, 2c. per lb. on the silicon content;

Others On List

Ferrochrome or ferrochromium containing less than 3 per cent carbon; present duty, 25 per cent;

Ferrochrome or ferrochromium containing 3 per cent or more of carbon; present rate of 1¼c. per lb. on the chromium content represents a reduction of 50 per cent, the maximum concession permitted and cannot, therefore, be reduced further.

Hollow bars and hollow drill steel valued above 8c. and not above 12c. per lb.; present duty, 2½c. per lb. plus ¾c. per lb.

Two Bridges Planned to Replace Niagara Span; Salvage Doubtful

BUFFALO.—Collapse of Niagara Falls' Fallsview bridge, throwing 2300 tons of difficult-to-salvage scrap steel to the Niagara River, has been followed by two plans for replacement. International Railway Co., owners of the collapsed bridge, has asked two engineering firms, Modjeski & Masters, New York, and Montserrat & Pratley, Montreal, to submit designs for a new structure.

Other interests, according to T. B. McQuesten, Ontario Minister of Highways, will push plans to build a new bridge over the Niagara whether or not International Railway rebuilds.

Meanwhile experienced wreckers are fighting shy of the project because of risk to life and investment. The 2300 tons of scrap steel lie on the solid ice pack in the river. Shifting of the pack is distorting the old bridge and scrap men say that the only practicable way to salvage the old steel would be to string a "high line" across the 165-ft. gorge from the American to the Canadian shores, drop baskets with workmen from the line and have them "torch" the structure to pieces in small lots which would be pulled

over the ice to the American shore, and hoisted up the high steel bank. However, once the jam starts to move down-river, the wrecking would have to cease.

It is believed there will be no attempt to salvage the steel and the structure will be carried farther down the river on the ice, or will fall through to the river bed when the ice moves. The river is approximately 150 ft. deep at this point.

Court Rules NLRB Proceedings Can Not Be Enjoined

WASHINGTON.—National Labor Relations Board proceedings cannot be enjoined by court action because no damage can be shown until the Board has issued a cease and desist order.

This in substance was the decision of the United States Supreme Court, Monday, in passing on suits filed by the Bethlehem Shipbuilding & Dry Dock Co., Newport News, Va. The

decision was unanimous except for Justice Cardozo who was ill.

The Court held that there was no final order from which an appeal could be taken and that no enforcement can follow a Board order until the Board appeals to the circuit court for compliance which the Court would refuse if illegal damage could be proved.

The NLRB brought charges against the shipbuilding companies alleging unfair labor practices. The companies contended their business did not enter into or affect interstate commerce and denied they were under jurisdiction of the NLRB. On these grounds they attempted to enjoin NLRB proceedings.

Machinery Exports In 1937 Near Peak

INDUSTRIAL machinery exports for 1937 totaled \$240,449,734, a 52 per cent increase over \$158,484,527 in 1936 and only 7 per cent under 1929's record of \$257,050,965. December shipments of \$24,122,242, compared with \$14,783,021 in the like 1936 month and reached the highest monthly value ever recorded except for several months in 1929, the machinery division of the Department of Commerce reports.

In December (compared with December, 1936) power-generating equipment, except electric and automotive, increased 70 per cent to \$1,565,450 against \$921,089; construction and conveying machinery, 140 per cent, \$2,066,984-\$852,301; mining, well and pumping machinery, 48 per cent, \$5,203,635-\$3,503,585; power-driven metal-working, 97 per cent, \$7,720,824-\$3,913,820; other metal-working, 30 per cent, \$359,361-\$276,250; textile, sewing, and shoe, 24 per cent, \$2,150,452-\$1,729,798; and other industrial machinery, 41 per cent, \$5,055,536-\$3,576,178, statistics show.

50-Ton Electric Furnace Under Way for Timken

CLEVELAND.—Construction has started on a 50-ton, three-electrode, arc type tilting electric furnace for Timken Roller Bearing Co. in Canton, Ohio. Installation of the new Heroult furnace will raise capacity of the company's electric steel division from 15,000 tons a month to 20,000 tons a month.

Cost of the furnace and auxiliary equipment is estimated at \$350,000. An oxygen distribution system is being installed in the plant.

Navy Construction Plans To Require 400,000 Tons

WASHINGTON. — Excluding experimental vessels, plain steel requirements for the proposed naval programs are estimated at about 154,000 tons. Taking into account special steel, such as high tensile material, forgings, machinery, armor, etc., the total is estimated at approximately 400,000 tons. The number of "experimental" vessels has not been made known but their cost will be \$15,000,000 and steel requirements will not be great.

The programs are divided into two parts. They aggregate 91 vessels of 519,542 tons. Of these 22 of 118,880 tons are carried in 1939 naval appropriation bill which has already passed the House. The much larger program, asked for by the President in a special message last week, calls for 69 ships of 400,662 tons.

The 1939 appropriation bill will involve only about 43,000 tons of plain steel of which about half will go for two battleships whose requirements

will be about 22,000 tons. The new program, calling for the bulk of the steel, has for its largest units three battleships which will require about 33,000 tons of plates.

Half Week's Output

Despite these large steel tonnages they will not prove an important stimulation for the industry. When related to finishing capacity of some 1,000,000 tons a week, the entire estimated total represents only about one-half week's production. Moreover, the larger program asked for by the President calls for only a portion of the outlay for 1938.

The three battleships and eight cruisers, however, would be laid down during the present year. But placing of steel orders for the programs will have to await preparation of specifications and once the steel is ordered it will not only be broadly spread over various makers but will be delivered over periods as long as three years for the capital ships.

Cleveland Machine Dealers To Meet

CLEVELAND.—The first regional meeting of the Associated Machine Tool Dealers in this district will be held Tuesday, Feb. 8, at the Cleveland Club. Salesmen, direct factory representatives and dealers are invited

to the dinner session. Ultimately it is hoped that a Cleveland association can be formed.

Among invited speakers are Tell Berna, manager National Machine Tool Builders' Association; A. G. Bryant, Chicago, president of the Associated Machine Tool Dealers; L. P. Robinson, sales manager Werner G. Smith Co., Cleveland.

G. J. Hawkey, Cleveland Duplex Machinery Co., is the regional committeeman arranging the meeting.

The relations committees of the National Machine Tool Builders' Association and the Associated Machine Tool Dealers will meet here earlier on the same day.

U. S. Steel Taxes Top Dividends in Nine-Year Period

UNITED STATES STEEL CORP. paid \$15,000,000 more in taxes than its stockholders received in dividends during the years from 1928 through 1936, *US Steel News* says in its February issue in an article on "Who Pays the Taxes."

During that period the corporation paid \$2,502,000,000 in wages and \$379,000,000 in taxes to various units of the Government which had "put no savings into the properties and had taken no risks."

In terms of wages the taxes paid during the nine years 1928-36 were equivalent to about one and a third years' wages and salaries. In 1936, said *US Steel News*, taxes equaled 1.8 months of wages and salaries, and in 1932, when operations were at a low level, taxes paid the Government equaled three months' wages and salaries.

"No matter from what source this tax money seemed to come, however, in the end it mostly came from out of somebody's wages," the publication said.



PICTURED at the recent Iron & Steel Engineers' convention at Pittsburgh, where members and guests visited Jones & Laughlin Steel Corp.'s new 96-in. wide strip mill are, left to right, F. O. Schnure, electrical superintendent, Bethlehem Steel Co., Sparrows Point, Md.; G. R. Carroll, electrical superintendent, Jones & Laughlin; H. G. R. Bennett, assistant general superintendent, Carnegie-Illinois Steel Corp., Duquesne, Pa.; Professor W. Trinks, head of mechanical engineering department, Carnegie Institute of Technology; T. E. Hughes, chief maintenance engineer, Carnegie-Illinois, Duquesne, Pa.; L. F. Coffin, president, Association of Iron & Steel Engineers; James Farrington, electrical superintendent, Wheeling Steel Corp., Steubenville, Ohio, and F. W. Cramer, electrical engineer, Carnegie-Illinois, Pittsburgh.

European Steel Men Here to Discuss World Markets and Prices

A DELEGATION of European steel men, representing the International Steel Cartel, arrived in the United States today (Feb. 4) on the *Normandie* to confer with American steel companies on world steel markets and prices. A series of meetings will be held in New York by the Steel Export Association of America, at which the European steel men will be guests.

Those who are to arrive on the *Normandie* are Hector Dieudonne, director general of the European cartel;

the Earl of Dudley, chairman of the British Iron and Steel Federation; I. F. L. Elliot, managing director of the British federation; Spencer Summers, a director of the federation.

Meetings have been held in Europe and in the United States over the past several weeks to discuss plans of co-operation between European and American exporters, the plan being to share world markets for steel on a quota basis at stabilized prices. There have been complaints recently from Europe that some American exporters

were selling steel abroad at extremely low prices, and there have been even mild threats of reprisals unless excessive price cutting were eliminated. A step toward reduction of export prices was recently taken in England, where premium prices that had been obtained for quick deliveries were abandoned.

The situation here is said to be that the major companies which are members of the Steel Export Association of America are adhering to world market prices, but some "free lance" companies are said to have taken business at considerably below the going level. The efforts of the European steel men at meetings here will be directed toward arriving at a better understanding so that an international price war on steel products may be averted.

Steel Exports From U. S. in 1937 Highest Since 1920

IRON and steel exports during 1937, exclusive of scrap, amounted to 3,471,990 gross tons valued at \$222,678,977 (compared with 1936 trade of 1,221,209 tons worth \$88,000,555), and were highest recorded except during the years 1916 to 1920, according to preliminary statistics of the United States Department of Commerce.

Highlighting the 1937 iron and steel export trade were the highest volume of pig iron shipments on record, a new annual tin plate peak, heaviest steel ingot shipments since 1918, heaviest rail shipments since 1928, strengthening in pipe, plate shipments approximating the 1917 level, and an average composite price per ton for 12 leading products of \$71.69, or \$11.40 higher than in 1936 and 77c. a ton above 1929.

Pig iron shipments in 1937 not only represented the highest individual volume exported within the semi-finished and finished iron and steel group, but made an all-time record of 872,436 tons against 5316 tons in 1936 and 46,357 tons in 1929.

Tin Plate at New High

Tin plate export volume last year also reached a new high at 343,339 tons (valued at \$39,435,467) compared with 258,965 tons in 1929.

Of total iron and steel exports last year 1,413,114 tons went to the Far East; Europe, 793,595 tons; North and Central America and West Indies,

765,611 tons; South America, 391,573 tons, and Africa, 108,097 tons. In 1936 only 266,098 tons went to the Far East.

Last year the United States shipped 4,095,894 tons of scrap valued at \$79,576,542, a new record, compared with 1,936,132 tons worth \$24,681,634 in 1936. Japan took 1,901,202 tons against 1,057,621 tons in 1936.

U. S. Steel Heads In New Offices

PITTSBURGH.—Some officials of the new United States Steel Corp. of Delaware, management company for United States Steel subsidiaries, have moved into their offices at 436 Seventh Avenue, Pittsburgh.

The offices are located in the Koppers Building and two of the four floors leased, the 14th and 15th, are being occupied this week. Benjamin F. Fairless, president, and his staff will share the 15th floor with Max D. Howell, vice-president, secretary and treasurer, C. V. McKaig, vice-president in charge of sales, and Walter Mathesius, vice-president in charge of production.

The 13th and 16th floor quarters will be open about March 1. Other executives who will move in as soon as their offices are ready include Thomas Moses, vice-president, raw materials; Charles D. Rhoades, vice-

president, purchases; R. E. Zimmerman, vice-president, research, and William Beye, vice-president, counsel and industrial relations.

Fight Check-off, Sokolsky Warns

PITTSBURGH.—"The only way we can attain recovery is to get rid of Government control. If Government would give industry a year's release from various restrictions, American industry would readjust itself and start upward," George E. Sokolsky, author and lecturer, told 2000 industrial, commercial and business leaders at the 37th annual dinner of the Traffic Club of Pittsburgh.

His talk, on "The Nature and Strength of the Capitalistic System," defended free and open business competition under a democratic form of government and criticised Communist and Fascist systems.

Mr. Sokolsky advised business leaders to repulse attempts by unions to obtain a check-off system and said "employer coercion of workers through the check-off to enforce a labor contract is not moral or legal. The greatest evil can be done to the working man, industry as a whole and to the capitalistic system by the extreme of the check-off."

Pennsylvania Closes Pitcairn Repair Shops

PITTSBURGH.—Pennsylvania Railroad car repair shops at Pitcairn, Pa., have been closed temporarily. Employees will be recalled as business warrants.

Steel Cartel Working Toward Stabilization Of Export Prices

LONDON (By Mail).—General satisfaction is expressed in the British steel industry at the outcome of the Jan. 17 Paris meeting of the European steel cartel. In the first place, those interests which had been in favor of cutting prices drastically in an endeavor to overcome the competition of outside American producers not adhering to the Dusseldorf agreement, were prevailed upon to agree to a stable price level in world markets. Secondly, opportunity was afforded the main United States export group to reaffirm its adherence to the "gentlemen's agreement."

So far as American producers are involved, the Paris meeting concerned itself with two questions, one being the purely technical matter of bringing sheets within the ambit of the existing understanding and the other the advisability of United States interests reaching agreement among themselves regarding export markets.

American Price Cuts

While the main American export group is adhering to the Dusseldorf agreement, there have been a number of cases during recent months where independent American producers have cut prices on certain contracts in various markets. These independents have been granting special discounts to European consumers which have brought down prices much below the minimums fixed by the cartel and agreed upon at Dusseldorf. The granting of discounts by America is said to have been particularly prevalent in steel plates, both heavy and fine, the European market in which is being seriously affected.

It is reported from the Continent that American competition is now being felt in the Far East and South Africa. In South Africa prices have had to be reduced by about \$5 per ton for bar iron and sections to meet this competition.

The cartel committee recognizes that the agreement concluded with the American producers is not a fully effective instrument. Should it be found impossible to reach a further agreement, in which the independent American producers can be included, it may be necessary for the cartel to consider an all-round reduction in steel prices

from the level established at Dusseldorf.

British Urge Stability

British influence in all recent cartel discussions has been employed in an

effort to prevent any sudden instability arising from a downward revision of prices which would engender uncertainty and affect confidence in the future course of export trade. It is not so much the costs of business that matter as the feeling of instability created by any widespread price divergence. In the United Kingdom it is hoped, although not very confidently, that an early upward swing of business in the United States will lead to the situation remedying itself.

Railroads Request Annulment Of Orders Fixing Coal Prices

WASHINGTON.—The Association of American Railroads and the American Short Line Railroad Association last week filed a petition with the District of Columbia Court of Appeals asking annulment of Coal Commission orders fixing prices on locomotive fuel.

Pending final determination of the legality of the coal board's orders, the court was asked to issue a stay postponing the effective date of the price schedules which, the 200 railroads charged, raised the carriers' annual fuel bill by \$21,000,000.

The coal board increased the price of locomotive fuel by 20¢ a ton and denied a request for postponement of the effective date of the price orders and also turned down the carriers' request for a public hearing.

Pointing out that the railroads use approximately 90 million tons of bituminous coal, or 22 per cent of the annual production, the petition charged that the coal board failed to consider substantial evidence in determining prices under the act, and that the prices fixed for railroad fuel are "unreasonably high."

Before the case was taken to court, the consumers' counsel had joined the carriers in their request for further hearings and alleged that the board had refused to turn over data to the counsel on which all minimum prices had been fixed. The board subsequently complied with the counsel's request but only shortly before board members appeared before an appropriations committee to make rec-

ommendations covering expenditures for the forthcoming fiscal year.

In addition to the railroads, hundreds of producers and consumer groups have requested revision of minimum prices. Since prices were made effective on Dec. 15, 1937, no less than 87 orders modifying price schedules have been issued by the board.

Grand Coulee Bar Award to Columbia

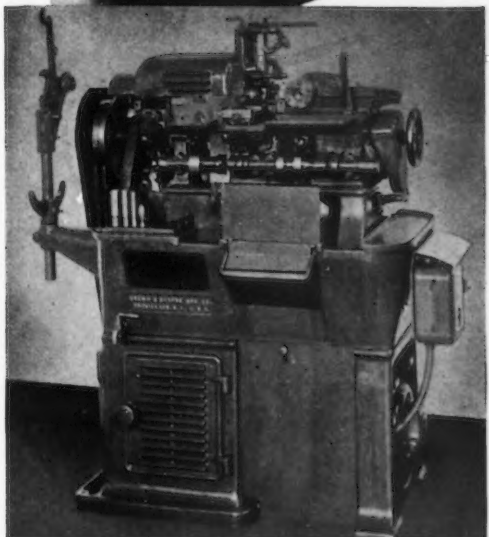
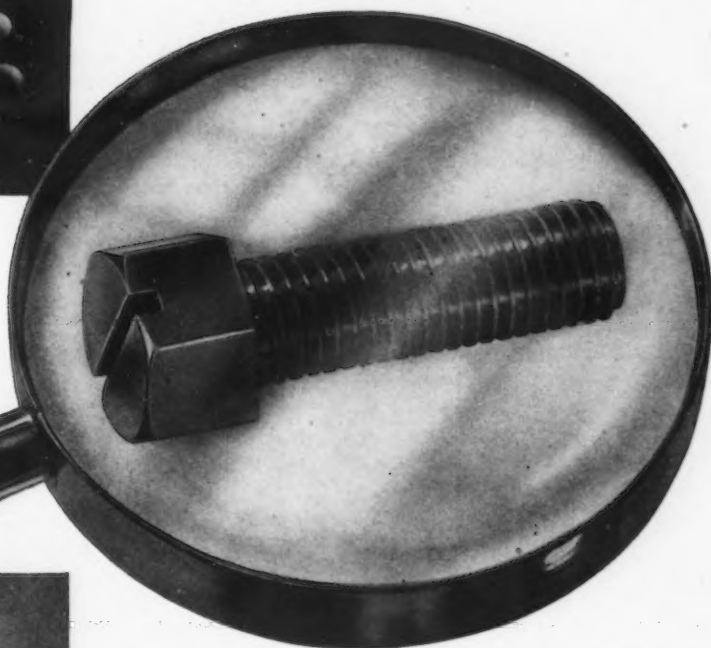
WASHINGTON.—With the award by the Bureau of Reclamation, Interior Department, of 1700 tons of reinforcing bars to the Columbia Steel Co., Pittsburg, Cal., the first contract for requirements calling for about 80,000 tons of steel has been let for completion of the Grand Coulee Dam, the general contract for which was awarded last week to the Interior Construction Co., Oakland, Cal., at \$34,442,240.

All materials are to be purchased by the bureau. To the Western Pipe & Steel Co., San Francisco, was awarded a \$1,456,624 contract for steel penstocks and pump inlet pipes to be fabricated at a plant on Columbia Basin in Washington. This contract involves 8373 tons of steel, mostly plates. Meanwhile, bids have been asked for other steel material and it is expected that advertisements for the remainder of such requirements will be published within 60 days.

"Immediately...the torn and ragged threads disappeared"



The effective work of Texaco Sultex Cutting Oil in machining this clutch-shaft screw brought about the adoption of these oils throughout the plant. Definite improvements are being made in many operations.



Brown and Sharpe Automatic Screw Machine, using Texaco Sultex Cutting Oil, produces perfect work on this difficult threading job.

Here is new efficiency for cutters and grinders:

TEXACO SULTEX CUTTING OIL—A
TEXACO SULTEX CUTTING OIL—B
TEXACO SULTEX CUTTING OIL—A-2
TEXACO SULTEX CUTTING OIL—A-4
TEXACO SOLUBLE OIL—C

THIS little slotted hex-head 12-32 cap-screw (S.A.E. 1020) looks simple enough . . . but it proved to be a tough number to handle in an automatic screw machine.

As they were coming through, the threads were torn . . . so badly that they wouldn't pass inspection.

Drawing off the cutting oil in the machines and replacing with Texaco SULTEX . . . and still at same speed, producing 105 pieces per hour . . . immediately the torn and ragged threads disappeared.

And not only this, but for 19 hours, perfect threads were produced without having to regrind tools. Shop personnel kept repeating "Remarkable."

Don't check off Texaco Sultex Cutting Oil as "just another cutting oil." Make a direct comparative test, and you'll see for yourself.

Trained lubrication engineers are always available for consultation on the selection and application of Texaco Cutting and Soluble Oils. Prompt deliveries assured through 2108 warehouse plants throughout the United States.

The Texas Company, 135 East 42nd Street, New York City.



TEXACO SULTEX

CUTTING & SOLUBLE OILS

Using Arithmetic in Collective Bargaining

(CONTINUED FROM PAGE 31)

With social security and all other taxes steadily rising year after year, the chances are that next year it will be still less.

"But applying this year's margin of 3 per cent on an expected business of \$330,000 next year, let's suppose we were to pay out half that profit as extra wages. That would give you \$1.85 more a week. But on the slender profit of less than \$5,000 from a volume of \$330,000 we could not build up a reserve sufficient to carry the company over the temporary lags in business that are sure to come, when there will be no profit at all but losses such as we suffered for four years of the depression; and to replace the obsolescent machinery in our plant, most of which is now 10 years or more old. In other words, we can't keep this business sound and stable, we can't safeguard your jobs, on a smaller return than we are now making. Remember that *back of every job in this plant is an investment of nearly half as much as our entire profit for last year.* That investment must be replenished from time to time out of profits.

"The idea of profit sharing for all employees sounds good, but there's just one catch in it. You can't have profit sharing without

loss sharing. Had it been in effect here you men would have been called upon for four years in succession to turn back a part of the wages you have received, to cover the losses."

Second Spokesman: "I've been impressed with what you are saying. One more question, Mr. Brown. This is not my idea but I've heard some of the boys remark that if the company didn't have to pay out so much in salaries for the executives it could do better by us in the shop. Do you care to make any remarks on that point?"

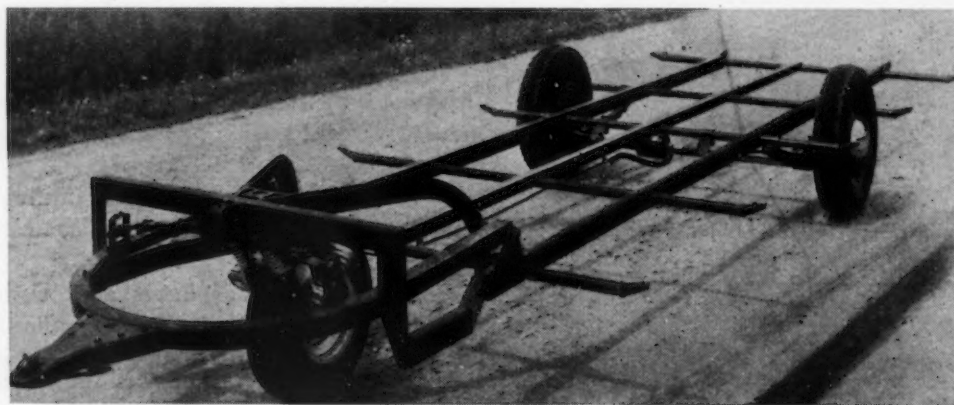
Mr. Brown: "I'm glad you brought that up. Our expenditures for executive salaries is no secret. We paid last year 6 per cent of our gross revenue. The average for our industry was 7 per cent, which indicates that we couldn't go below what we now pay and keep the talent that we have among our executives. You all know that we pay in the factory wages equal to and in some instances higher than those paid for similar work by other firms in this city. It's the same with our executives. What we pay them, too, is controlled in part by the opportunities which they could secure elsewhere. We pay enough to hold

our good men and we feel that they earn every cent of it in doing their part to keep you men regularly on the payroll with a successful going concern."

First Spokesman: "Thank you, Mr. Brown, for these facts. I think I speak for my fellow workers when I say we appreciate your frankness. I believe too, that we are all ready and anxious to discuss those means by which you say that between us—the workers and the management—you will try to work out ways for our earning more by producing more."

Wellman to Build Top Charged Open Hearth

WELLMAN ENGINEERING CO., Cleveland, has acquired the exclusive right and license to manufacture and sell open hearth furnaces, under the inventions of John O. Griggs and Herbert H. Leeks. These furnaces, arranged for top charging, eliminate the necessity of preparing the scrap to charging box size, since the scrap can be loaded into large capacity drop bottom boxes, which are handled by the hot metal crane and lowered into the furnace to a point near the furnace bottom before opening, and depositing the charge.



TO provide the undercarriage of a trailer vehicle with a capacity for truck loads, which can be handled with any type of tow car without regard for the tow car's ability other than its pulling power, the Saginaw Stamping & Tool Co., Saginaw, Mich., has developed the self-aligning, third-wheel cas-

ter unit shown. It is made of standard angle and channel shapes welded together, and is designed primarily for the base of a trailer unit for display purposes or for a freight conveyor. The third wheel relieves the rear axle of the tow car of excessive loads while traveling and when detached, and eliminates

jack-knifing and side whipping at any speed. The trailer is connected to the tow car by means of a hinged wishbone coupler which carries a transverse spring attached to the third wheel mount. The trailer dimensions are 6 by 16 ft. approximately. This is an outgrowth of the house trailer industry.